High-Speed Chip Placer

CP-842E
CP-842ME

Mechanical Reference

Preliminary

FUJI® Machine Mfg.Co.,Ltd.

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1. About This Manual

This manual contains important machine system information for the user.
The manual content is intended for specialized technicians who are familiar with Surface Mount Technology (SMT).

Please read this manual carefully in order to ensure safe and efficient machine operation. This manual has been written specifically for the CP842E and CP-842ME.

Unless otherwise stated, all explanations apply equally to all machines.

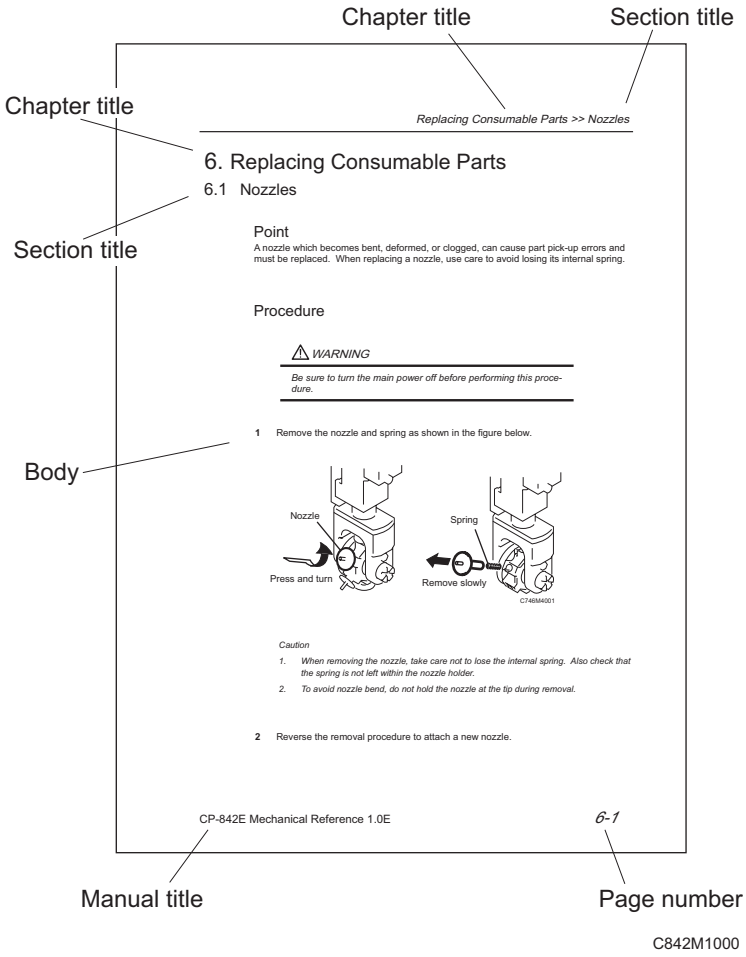
1.1 Manual Structure

This manual consists of the following ten parts.

1. About This Manual
2. Safety
3. The Machine
4. Basic Operation
5. Maintenance
6. Replacing Consumable Parts
7. Adjustments
8. Troubleshooting
9. Setup
10. Supplement

1.2 Page Layout

In addition to the main body of the manual, each page includes chapter title, section title, page number, and the manual title.


Chapter title
Section title
Chapter title
Replacing Consumable Parts >> Nozzles
6. Replacing Consumable Parts
6.1 Nozzles
Section title
Point
A nozzle which becomes bent, deformed, or clogged, can cause part pick-up errors and must be replaced. When replacing a nozzle, use care to avoid losing its internal spring.
Procedure
WARNING
Be sure to turn the main power off before performing this procedure.
1 Remove the nozzle and spring as shown in the figure below.
Body
Nozzle
Spring
Press and turn
Remove slowly
C746M4001
Caution
1. When removing the nozzle, take care not to lose the internal spring. Also check that the spring is not left within the nozzle holder.
2. To avoid nozzle bend, do not hold the nozzle at the tip during removal.
2 Reverse the removal procedure to attach a new nozzle.
CP-842E Mechanical Reference 1.0E
6-1
Manual title
Page number

C842M1000

Body:	Text and illustrations are used to explain procedures.
Chapter Title:	The chapter number and title are shown on the header of each page.
Section Title:	Section number and title. A chapter consists of multiple sections, and the section is also shown on the header.
Manual Title:	This identifies the machine and type of manual.
Page Number:	This numbers consists of the chapter number and the page number within that chapter. “1-1” indicates chapter 1, page 1.

Note: The reference numbers at the bottom right of the illustrations are for administrative purposes only, and are in no way connected to the content of the manual.

1.3 Notation Conventions Used in this Manual

The names of operation buttons, touch screen titles and commands, and keyboard keys are enclosed in brackets [ ].

MEMO:

2. Safety

Fuji machines are designed and produced with safety as one of our main considerations. However, even a perfectly designed machine can be damaged, or someone can still be injured if the user does not follow the safety rules. It is the responsibility of the user to make sure all safety rules are followed during operation and maintenance. Be sure to read these safety rules before operating the machine. Keep this manual close at hand when operating the machine.

2.1 About Symbols

This section provides an explanation of the relevant safety precautions to be adhered to by both operators and those responsible for maintaining the machine. An explanation of the warning labels attached to the machine is also provided.

This manual employs the use of descriptive symbols and provides details of the level of danger involved in certain operations to accompany the explanations of machine warning labels and safety related items. Be sure you understand the meanings of these symbols before reading the manual.

Hazard Definitions

Symbol	Definition
⚠ **DANGER**	Failure to observe this hazard warning will lead to severe injury or death.
⚠ **WARNING**	Failure to observe this hazard warning may lead to severe injury or death.
⚠ **CAUTION**	Failure to observe this hazard warning may lead to personal injury or damage to the machine.

Examples of Symbols Used

Symbol	Explanation
	Hazard A triangle is used to draw your attention to a hazard. The symbol inside the triangle indicates the nature of the hazard (in this case, electrical shock).
	Prohibition A circle with a diagonal line is used to draw your attention to an operation that is prohibited. The symbol inside the circle indicates the nature of the operation (in this case, disassembly).
	A circle with an exclamation mark is used to draw your attention to to a mandatory action. In other words, you are required to carefully carry out the given instructions.

2.2 Safety Rules for All Machine Types

⚠ DANGER
Do not approach moving parts during automatic or manual operation. ● Do not place hands or other body parts inside the machine during automatic operation or positioning. Body parts or clothing may be caught in the machine causing personal injury.

⚠ WARNING
Do not operate the machine with the safety covers or doors open. ● Do not leave covers or safety doors open, except during adjustment. ● hen adjustments are completed, return the covers and doors to their original (closed) position... ● When safety covers or doors are removed, body parts or clothing may be caught in the machine causing personal injury. Always be sure to replace the safety covers or doors.
Always verify the position of the EMERGENCY STOP buttons before operating the machine. ● Always be aware of the positions of the EMERGENCY STOP buttons so that they can be pressed quickly in case of an emergency.
Check the safety functions before starting operation. ● Before starting the machine check the operation of the EMERGENCY STOP button, the safety switches on the acrylic covers, the safety switch on the rear fence gate, the optical sensors on the rear fence and all other machine safety features. ● Contact a Fuji serviceman immediately if any of the safety functions fails.

⚠WARNING

Do not remove safety switches.

- Do not remove safety switches or disarm the safety functions.
- Disarming the safety switches may result in injury when others unknowingly press the START button.
- Fuji does not take any responsibility when a machine is disassembled without Fuji's permission, even if this results in accidents or trouble.

Check that there is nobody inside the machine when working on the machine with two persons or more.

- Verify that nobody is within or near the machine before operating the machine. Operating the machine may cause injury to the person who is carrying out maintenance.
  [Example]
  If one person moves the device table while another person is exchanging a feeder, the latter may be injured.

Do not close the fence when someone is inside the fence.

- When the fence is opened, it is safe to approach the machine. Closing the fence, however, will put anybody working inside the fence in immediate danger when the RESET or START button is pressed. Be sure to leave the fence open when anyone is inside the fence.

Do not approach a machine that has stopped moving.

- There are times during automatic operation when the machine may appear to have stopped while it is waiting for a board, waiting for the next machine, reading marks, transmitting data, etc. In such cases, once certain conditions are fulfiled, the machine will begin moving again automatically, so care should be taken. Only approach the machine after the EMERGENCY STOP button has been pressed. When the message "Ready" displays at the machine display, the machine will begin to move once certain conditions are satisfied.
- Keep in mind that the machine will begin to move regardless of whether these conditions are satisfied intentionally or inadvertently.

Resupply solder paste, glue and parts while the machine is in manual mode.

- Never resupply solder, glue or parts during automatic operation unless instructed otherwise. Body parts or clothing may be caught in the machine causing personal injury.

⚠ WARNING	
Do not place hands near the main conveyor. ● Hands or other body parts may be caught in the machine.	
Always turn the 200V power supply off when cleaning or lubricating the machine. ● When the 200V power supply to the machine is turned on, the servo amps will be activated. In this condition the machine may unexpectedly begin to move.	
Do not insert or remove connectors while power is being supplied to the machine. ● Removing or inserting connectors while power is supplied to the machine may not only cause damage to the machine, but may also cause electrical shock. ● Be sure to cut the power to the machine before inserting or removing connectors.	
Stay clear from the machine when it is being lifted. ● Never put hands or feet under the machine when the machine is being raised by means of a jack or other device for leveling or transport.	
Do not look into the conveyor inlet or outlet and do not open the cover. (Reflow oven) ● Do not look into the conveyor inlet or outlet and do not open the cover. [Example] The UV light on the reflow oven may damage eyesight or result in burns.	
Exchange the halogen lamp only after it has cooled down. ● When turned on, halogen lamps will reach high temperatures, resulting in skin burns when touched. To exchange a halogen lamp, turn off the power and allow the lamp to cool off sufficiently.	
Do not wear gloves made of cloth when operating the machine. ● Rubber gloves will tear when caught by the machine and prevent hands from being drawn into the machine. Gloves made of cotton or similarly strong material may cause hands to be drawn into the machine.	

⚠ WARNING

Long hair should be tied back.

- Long hair may get caught in running machines.
- Hair should be kept short or tied back so that it does not get caught in the machine.

Turn off the air supply when carrying out maintenance on cylinders, valves, and filters.

- Removing cylinders, valves, or filters without turning the air supply off, may cause parts or particles to be propelled into the eyes.
- Be sure to turn off the air supply when carrying out maintenance on cylinders, valves, and filters.

Be sure to wear protective glasses when removing parts from the machine.

- Be sure to wear protective glasses when removing or replacing parts.
  [Example]
  CP-6, 7, 8 nozzles use springs which may be propelled during disassembly. Be sure to handle the nozzles carefully to prevent eye injuries.

Check the machine monitor and the target axes while manually operating the machine.

- When operating the machine, carefully follow the instructions that are displayed at the machine display.
- Operating the machine without looking at the machine display may lead to operating errors or result in damage to the machine or products.

Do not touch the servo amp power terminal for at least five minutes after turning off the power.

- The servo amp retains a high voltage even after the power has been turned off. Always wait at least five minutes, and ensure that the CHARGE lamp is off, before undertaking any work that may result in contact with the servo amp terminal.

⚠ CAUTION	
Do not operate the machine after removing or disabling sensors. ● Removing or disabling sensors will disarm the interlock, leading to collisions and damage to the machine.	
Check the machine display to determine whether HELPS compatible machines are in the middle of performing changeover. ● During operation in automatic mode on machines equipped with automatic changeover equipment, it may be difficult to actually see automatic changeover taking place from the front of the machine. When a message appears at the machine display, follow the instructions that are given.	
Ensure to use the handle when opening or closing the safety doors, fences or covers. ● Opening or closing the safety doors, fences or covers without using the handle may result in injury to the hand. ● Opening or closing the safety doors, fences or covers with force, without using the handle may result in damage to the machine.	

2.3 Safety Rules for Individual Machine Types

2.3.1 CP-842E/842ME Machines

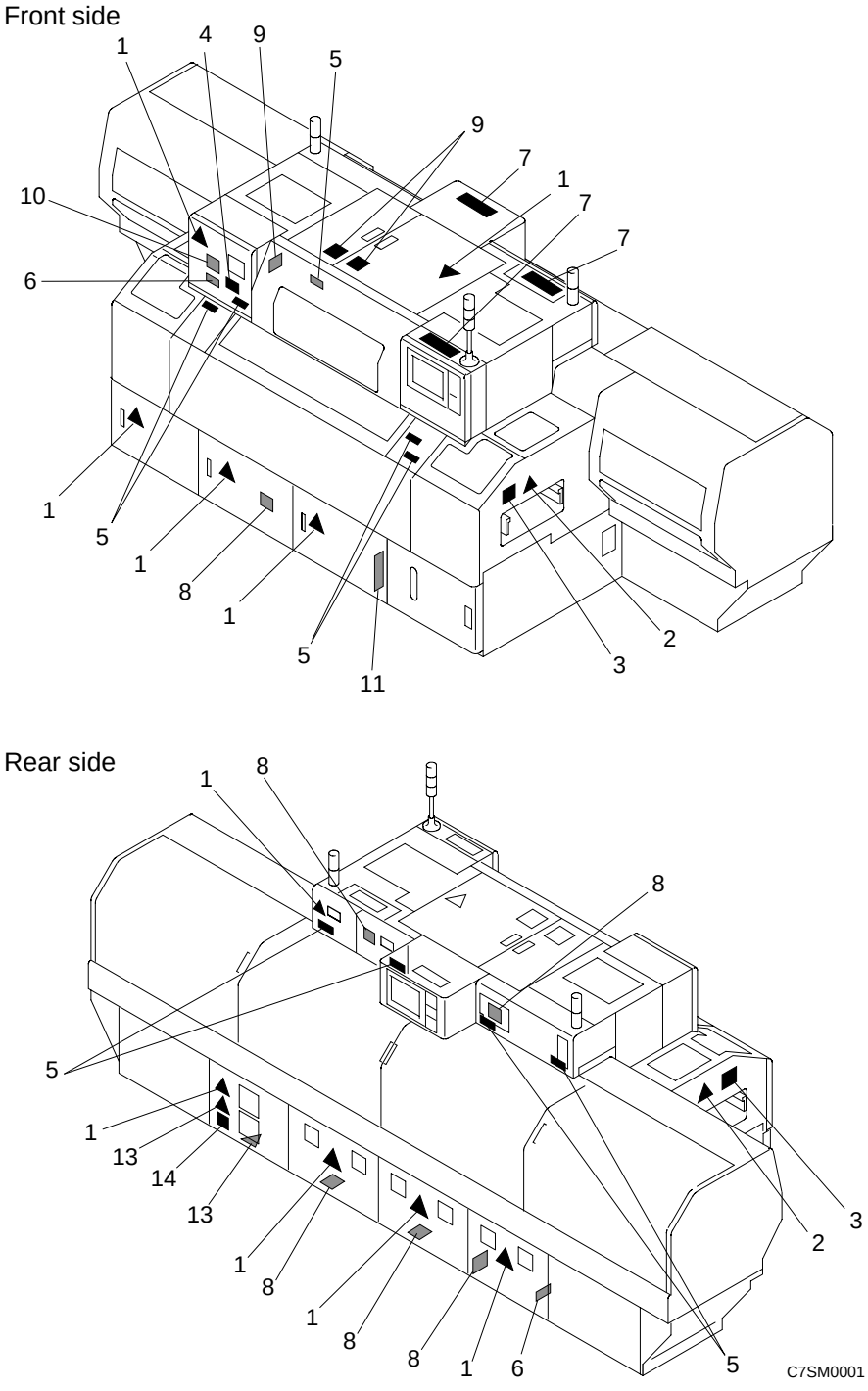
⚠ WARNING	
Do not insert hands or other body parts into the conveyor inlets. ● Body parts may get caught in the machine resulting in injury.	
Do not operate the machine when the front/rear cover has been removed. ● Body parts may get caught in the machine resulting in injury.	
Do not perform cam box maintenance with power to the machine on. ● Injury may result from electric shock if maintenance on the cam box is carried out with the power to the machine on.	
Caution required if cam is not at its origin (0°). ● Operators must ensure the cam is at its origin (0°) prior to carrying out any operations on the machine. If the cam is not at its origin, recoil from springs used to drive the placing heads may cause unexpected movement which is potentially dangerous for the operator. If an emergency stop occurs, the machine stops immediately. In this case there is a strong possibility that the cam will not be at its origin. ● If the cam is not at its origin when the machine stops, use the cam handle to return it to its origin.	
Do not stare into the laser beam. (On machine fittied with laser type fiber sensors (class 2)) ● Exercise extreme caution when working in areas where there is a risk of eye damage from the laser beams.	

2.4 Safety Labels

To warn the operator of hazards, safety labels are attached to the machine at the positions indicated in the figure below.

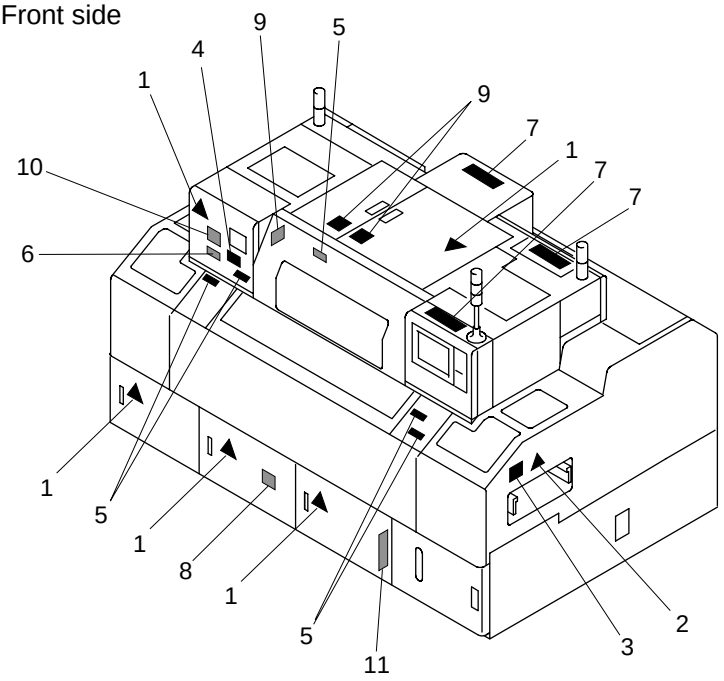
Familiarize yourself with each label and its message before operating the machine.

<CP-842E>

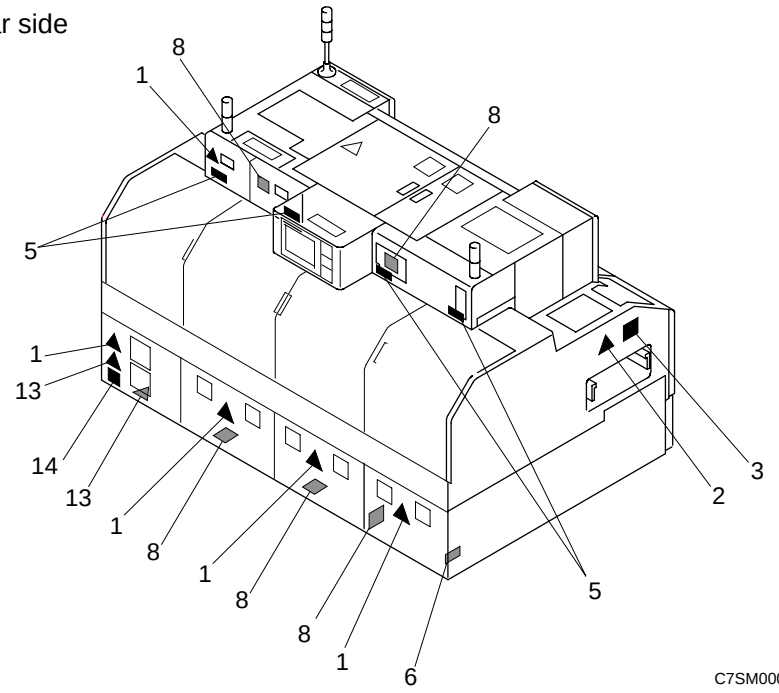


<CP-842ME>

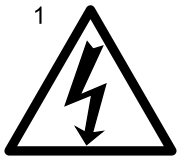
Front side



Rear side



1



[感電注意]

13

[高温注意]

2

[危険]

14

危 険
高温注意

DANGER
Coution:HOT

DANGER
RISQUE DE BRULURES

3

危険

運転中は中へ手を入れないで下さい。
機械が動作するため危険です。

DANGER

Never insert your hand
inside an operating machine.
Moving parts may cause injury.

8

〈注意〉
電池を正しく交換しないと爆発を起こすおそれがある。
機器製造者が指定した電池（同一型名のもの又はその同等品）以外の電池とは交換しないこと。使用済みの電池は、製造者の取扱指示に従って処分すること。.

〈CAUTION〉
AN EXPLOSION MAY OCCUR IF THE BATTERY IS NOT REPLACED PROPERLY. USE THE BATTERY TYPE SPECIFIED BY FUJI (OR EQUIVALENT BATTERY TYPE).USED BATTERIES MUST BE DISCARDED FOLLOWING THE MANUFACTURER'S INSTRUCTIONS

4

<警告>
保守作業は機械電源を落としてから行ってください。
保守作業中はUPSユニットの電源がOFFになっている事を確認してください。

<WARNING>
THE MACHINE MAIN CIRCUIT BREAKER
MUST BE SWITCHED OFF DURING ALL SERVICING.
ENSURE THAT THE UPS IS SWITCHED OFF AT
THE UPS UNIT DURING ALL SERVICING.

9

警 告 カム用のスプリングの張力が緩んだ位置にいないと、カム及びタレットが動き出すことがあります。メンテナンス作業の前には、必ず電源を切りエアーを止めてください。又カムが安定点で停止していない場合には、ここへ手を入れてはいけません。カムが安定点で停止していないと、スプリング力でタレットが回転する場合があります。
カム及びタレットのメンテナンス作業は、同時に二人以上で行なってはいけません。

WARNING! The Cam/Turret will move if the cam spring tension is not relieved. To avoid serious personal injury, ALWAYS lock out/tag out this machine before performing maintenance. NEVER reach into this area unless spring tension to the Cam/Turret is first relieved and the Cam/Turret is at a resting position.
Cam/Turret maintenance should only be performed by one person at a time.

ATTENTION! La came/tourelle est susceptible de bouger sousl'effet des ressorts de cames.
Pour eviter dommage corporel. TOUJOURS couper l'alimentation electrique et pneumatique avant toute intervention de maintenance.
NE JAMAIS approcher cette zone sans s'etre assurre gue les ressorts de la came/tourelle sont detendus, et que la come/tourelle est au repos.

5

警 告

ここにバイパスキーを投入すると
機械の安全装置が解除されます。
使用するときは十分注意して下さい。

6

〈ご注意〉
トランスの一次配線は供給電圧に合った電圧タップを選択して下さい
〈Caution〉
Use appropriate tap on transformer when wiring power supply cable to primary side.

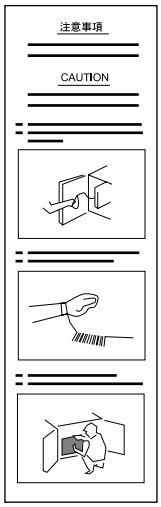
10

供給電源の電線太さ
INTERNAL CONDUCTOR AMPACITY

電線太さ Conductor Size AWG or MCM (mm²)		電流容量 Ampacity in Enclosure (A)
14	(2.1)	20
12	(3.3)	25
10	(5.3)	40
8	(8.4)	60
6	(13.3)	80
4	(21.2)	105

電源給電は、60～75℃以上の耐熱性を持った銅線で配線してください。
60/75 ¼C field installed
copper conductors are required.

11

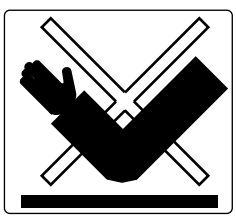


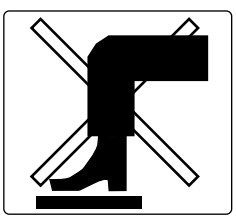
7

操作BOXに乗るな

DO NOT PLACE FEET
ON OPERATION BOX.

NE PAS MARCHER
SUR LE BOITIER
DE COMMANDE





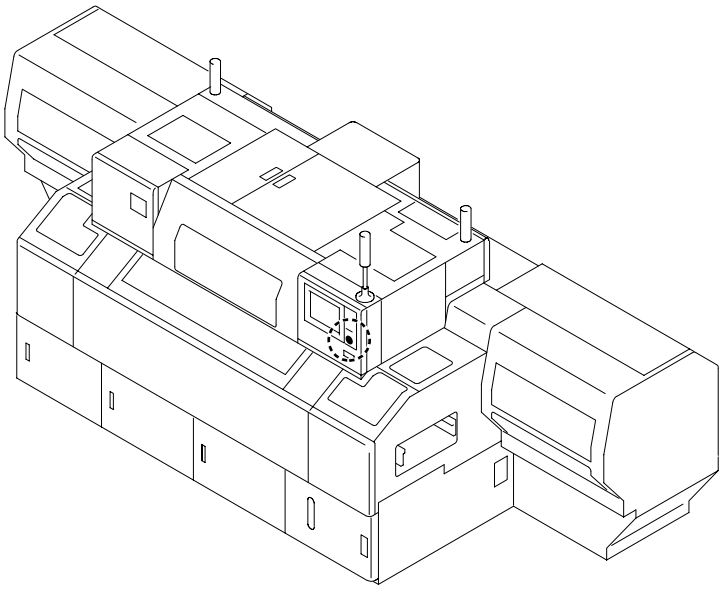
C7SM0002

2.5 The EMERGENCY STOP Buttons

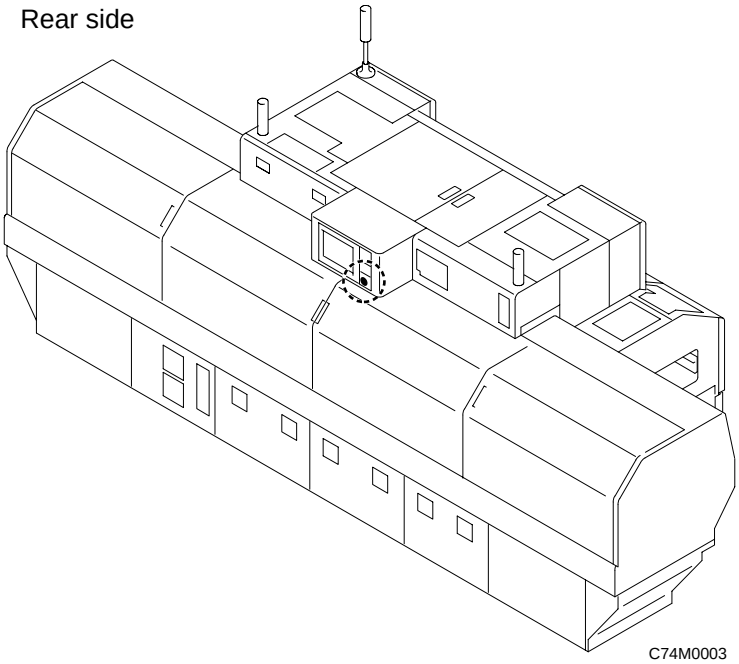
In the event of an emergency, press any of the red EMERGENCY STOP buttons located on the machine at the positions indicated in the figure below.

<CP-842E>

Front side



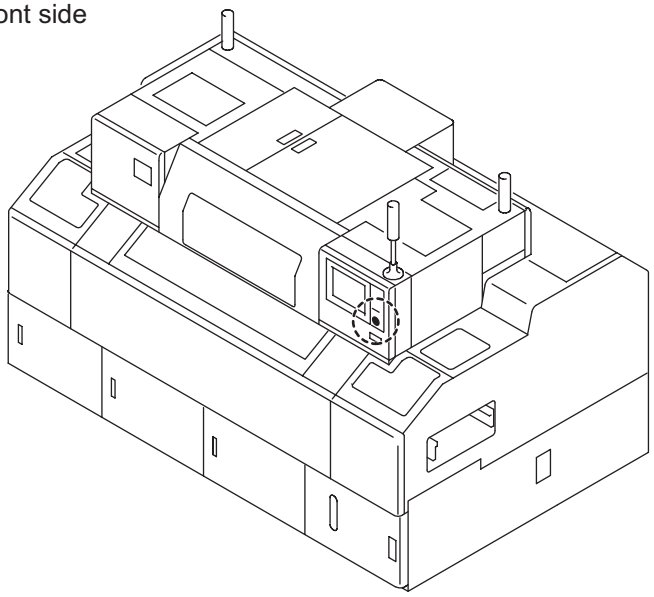
Rear side



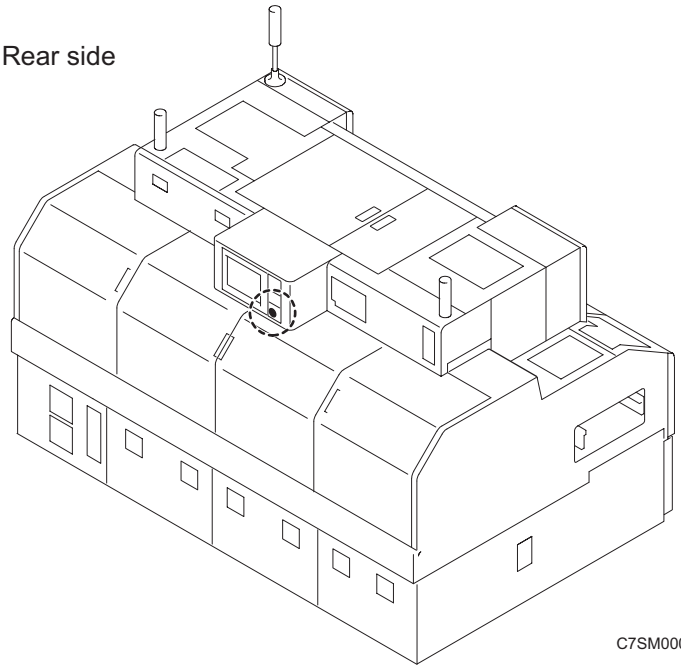
C74M0003

<CP-842ME>

Front side



Rear side



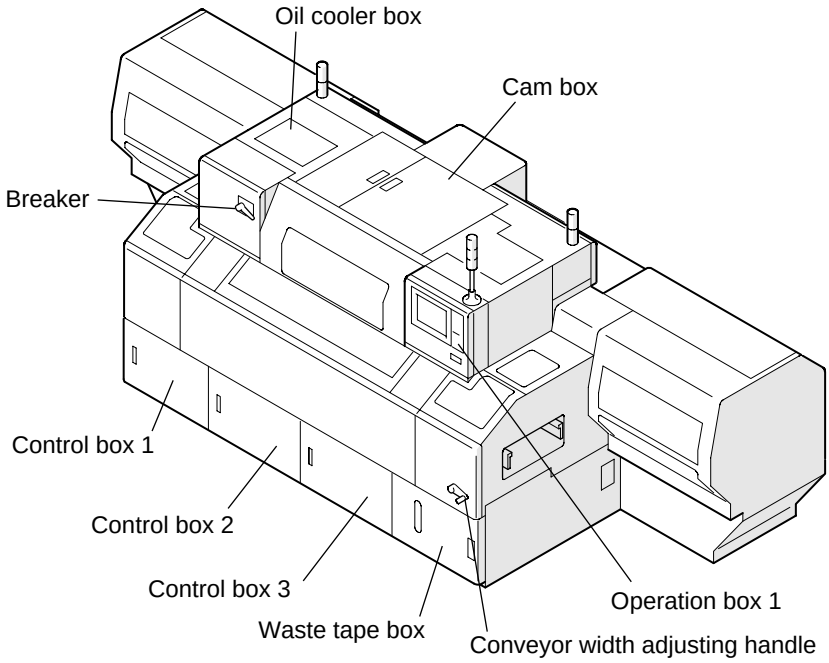
C7SM0009

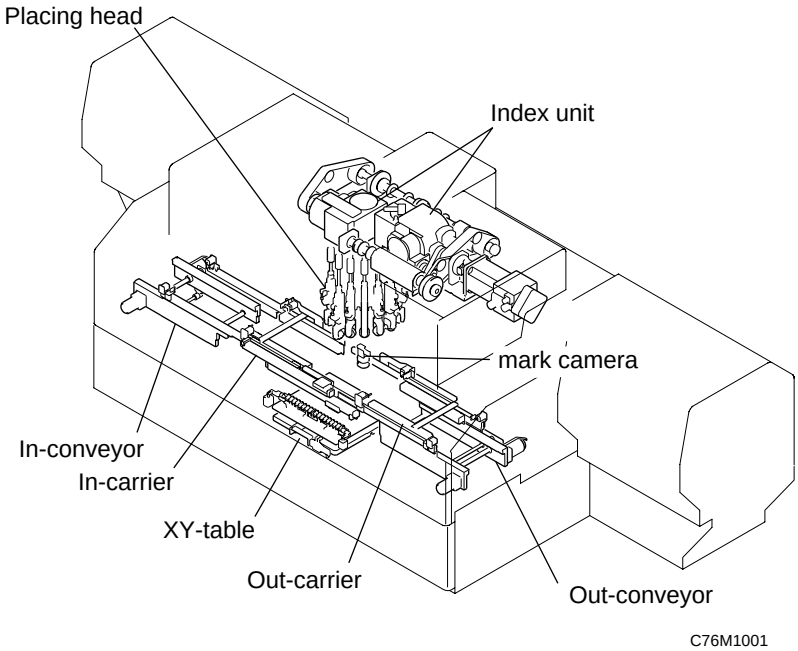
3. The Machine

3.1 Machine Components

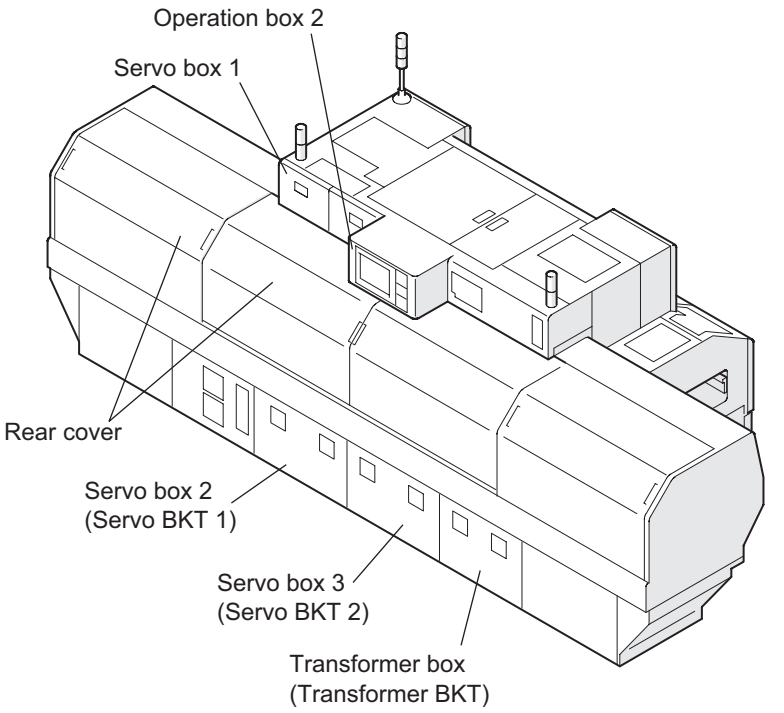
3.1.1 General View

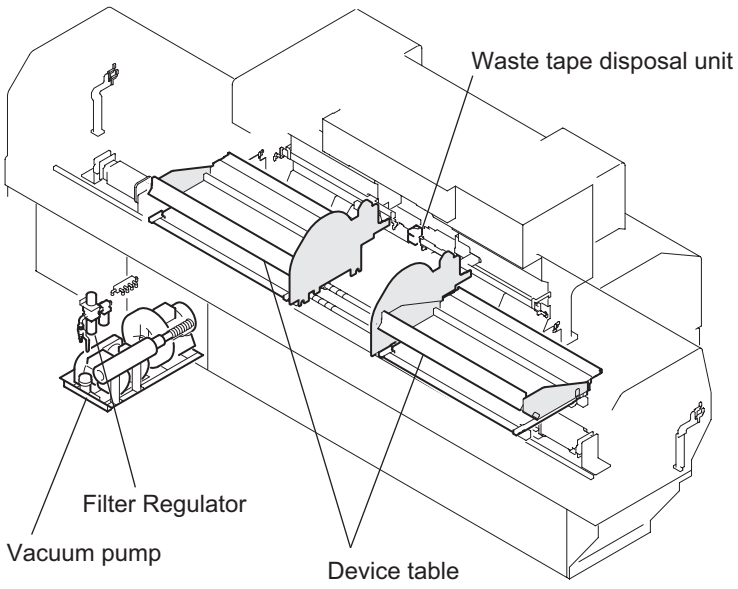
Front Side<CP-842E>





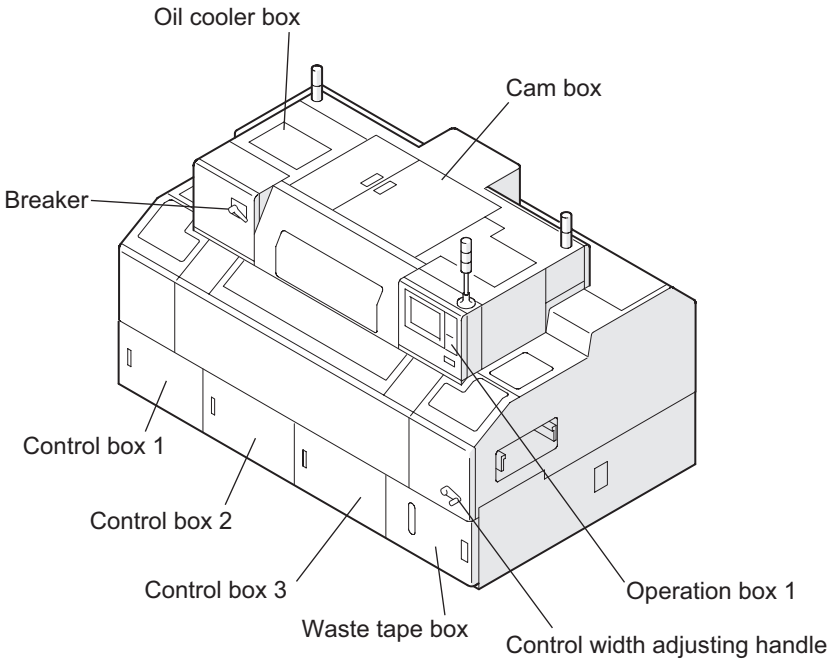
Rear Side<CP-842E>

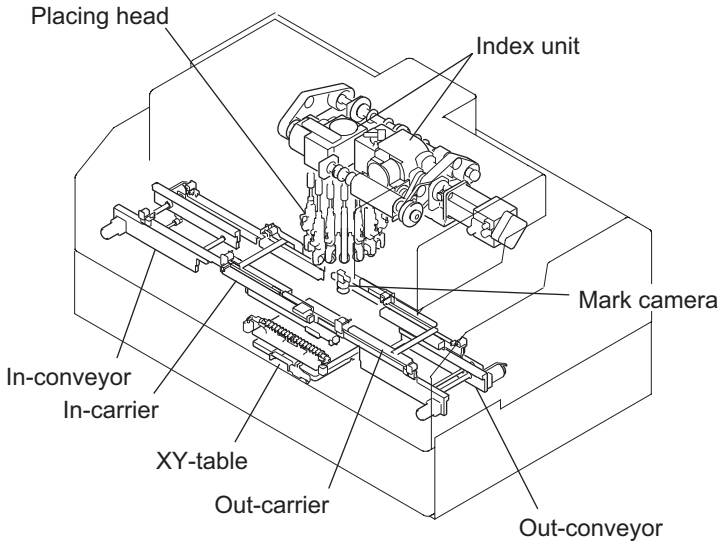




C746M1002

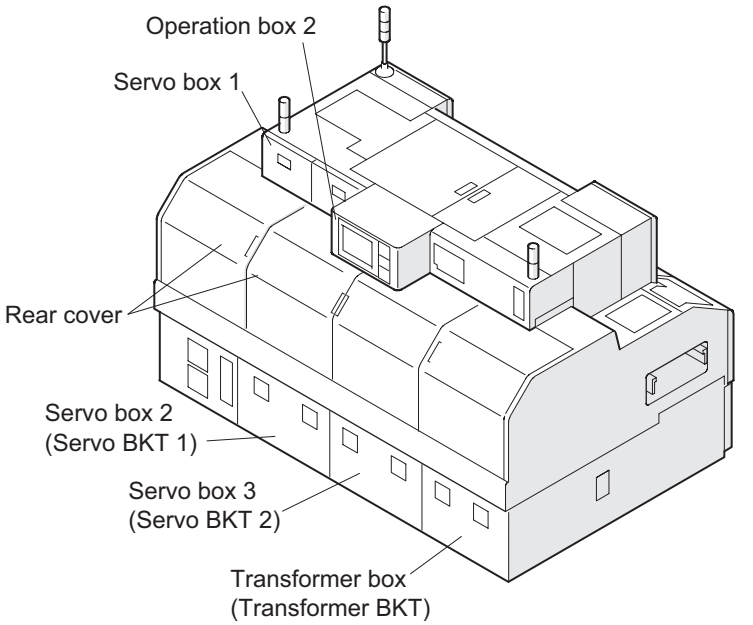
Front Side<CP-842ME>

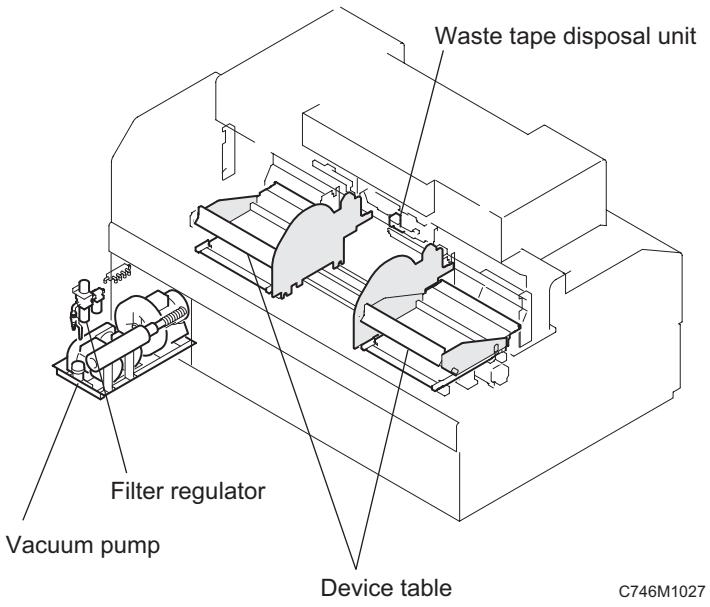




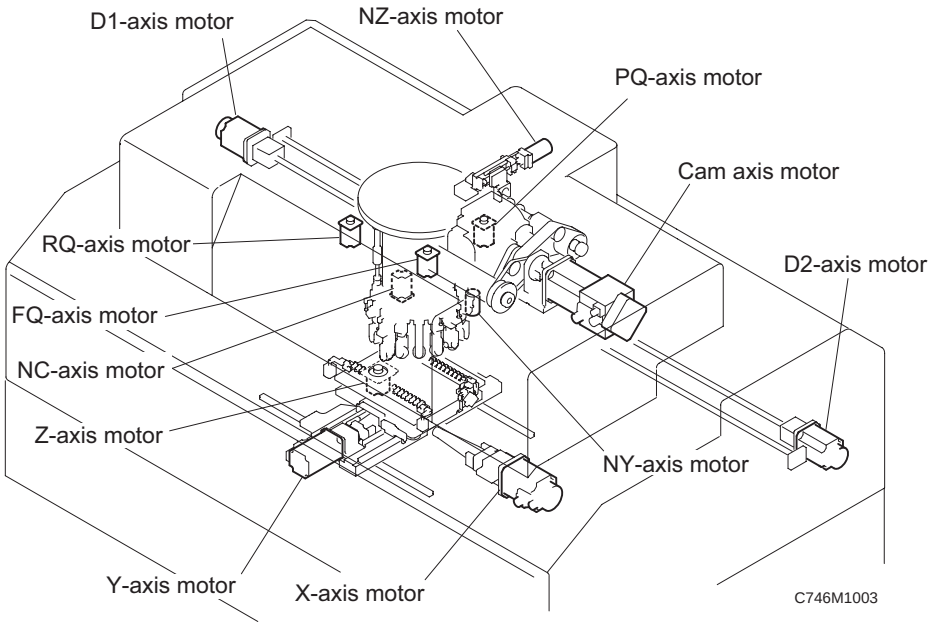
C76M1026

Rear Side<CP-842ME>



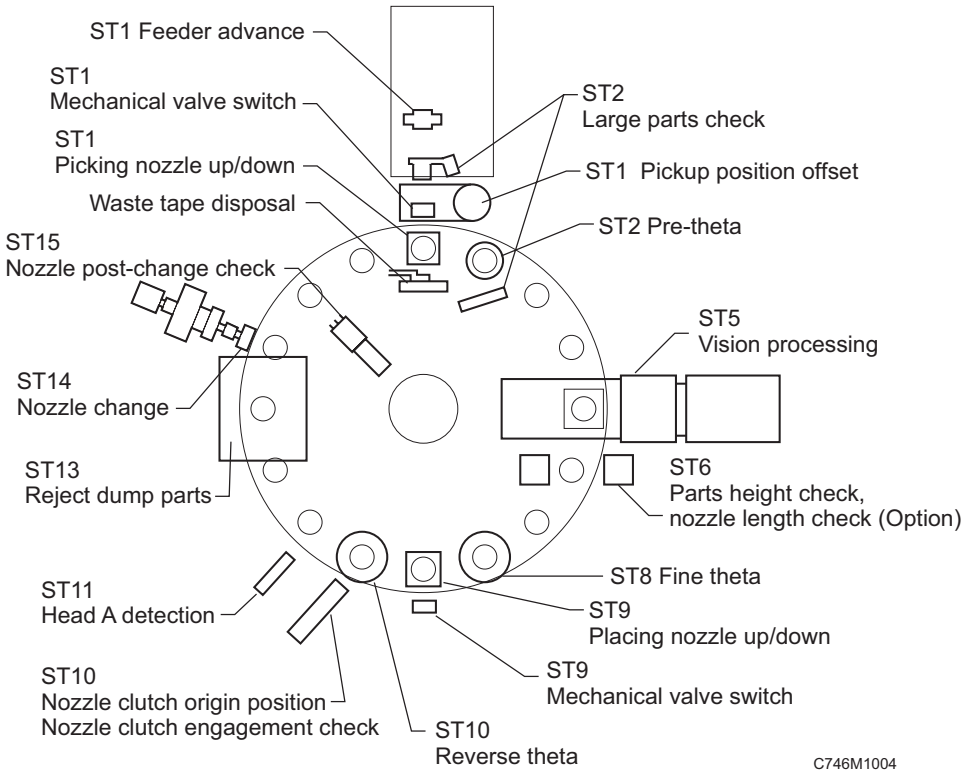


3.1.2 Servo Control Axes

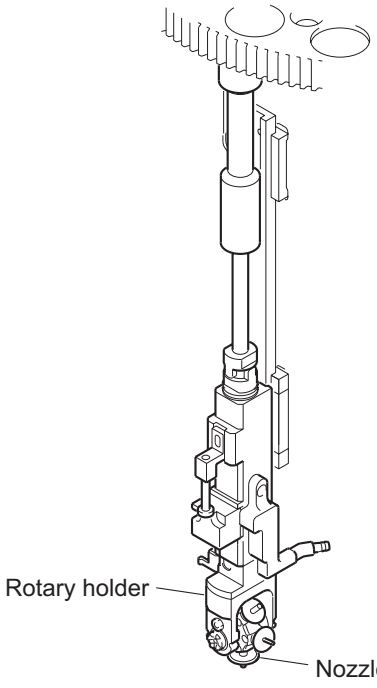


Note: The above figure shows the CP-842ME, but the position of the servo motors is the same on the CP-842E.

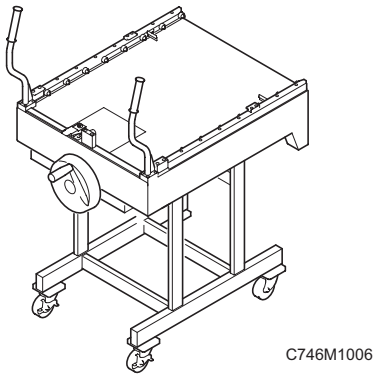
3.1.3 Rotary Head



3.1.4 Placing Head

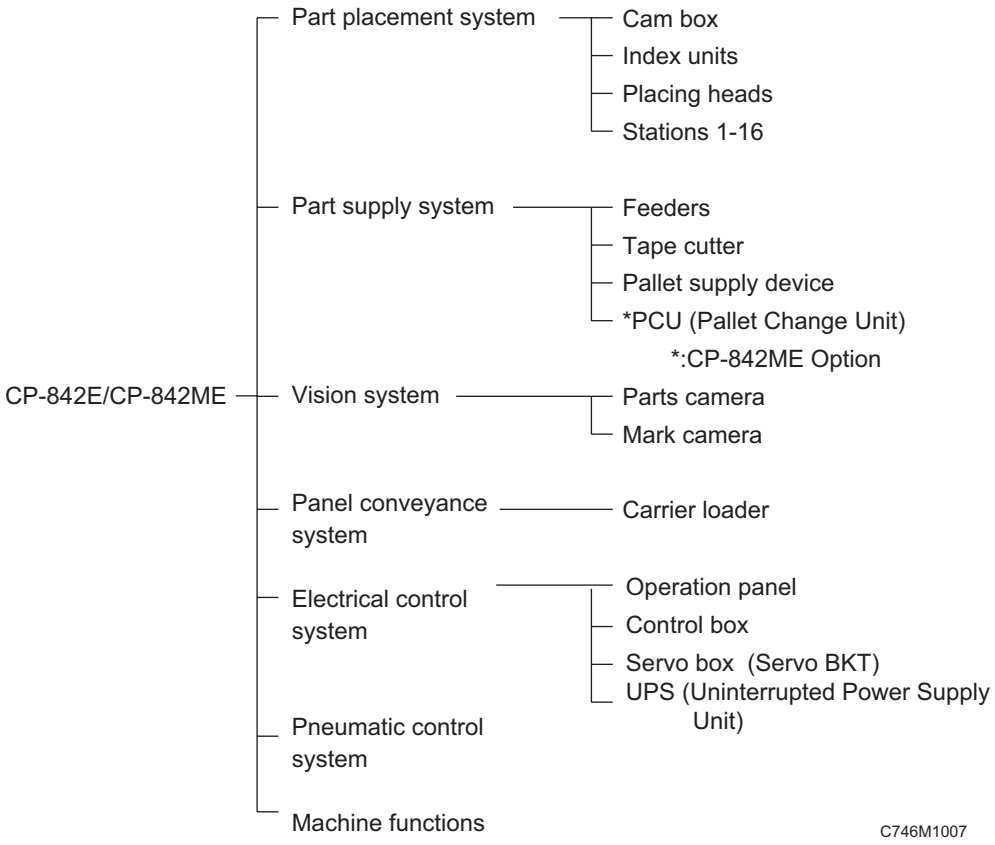


3.1.5 PCU (Pallet Change Unit)



Note: The PCU is optional on the CP-842ME.

3.2 Functions of Each Part



3.2.1 Parts Mounting System

Cam box

The cam box system comprises a cam axis motor, index units, cam axes, cam levers, and air cylinders.

Index units

Two index units are housed in the cam box. One is used to index the nozzle shaft clutch, and the other is used to index the nozzle holder.

Placing heads

There are a total of 16 placing heads mounted around a single rotary head. The placing heads comprise nozzles, shafts, and holders. Each placing head is fitted with six nozzle types, with the appropriate nozzle being selected in accordance with the size of the part which is to be placed. Placing heads pick up parts from the feeder, hold the parts during vision processing, and then place the parts on a panel.

Stations 1-16

Stations 1-16 represent the positions of the 16 placing heads. In this manual, "Station" is abbreviated as "ST". The functions of each of the 16 stations are explained below.

ST1: Picks up parts from the feeder, indexes the feeder, and offsets the NY-axis pickup position.

ST2: Checks for the presence of large sized parts. Also performs pre-rotation (PQ) operations. The pre-rotation function rotates parts in advance to a position near the placement angle specified in the placement program. Pre-rotation occurs in 90-degree increments.

ST5: Two CCD cameras (Wide View and Narrow View) check the presence and pick-up condition of the parts.

ST6: Measures the height of parts which the nozzle has picked up (option).

Also,measures the length of the nozzles (option).

ST8: Performs fine-rotation (FQ) operations. Rotates a part to its final placement angle based on the vision processing results at ST5.

ST9: Places parts on the panels being produced. Parts rejected during vision processing at ST5 are not placed.

ST10: Performs reverse pre-theta (PQ) and fine-theta (FQ) rotation operations. Also checks the nozzle's origin position.

ST11: Verifies that nozzles lowered for part placement have been raised again, and checks the nozzle "Holder A" position for the production log.

ST13: Rejects parts deemed defective by the vision check at ST5.

ST14: Rotates the rotary holder to select among the 6 nozzles.

ST15: Checks the positions of the 6 nozzles after nozzle changes.

3.2.2 Parts Supply System

Feeders

The feeders supply taped parts to ST1 where they are picked up. The CP-842E/842ME uses WC feeders for CP machines. When using part reels 13-inches or larger, feeders with CP-7/CP-8 exclusive reel holders are required.

Waste tape disposal unit

The waste tape disposal unit is located beneath ST1 of the placing head, and consists of upper and lower cutters which cut the waste tape fed from the feeder. The cut waste tape is then carried through a vacuum duct to the waste tape box at the bottom of the machine.

Device tables

Device tables hold feeders and also are used for transport. The two device tables move on the D-axes as instructed in the production program.

The CP-842ME has an option for pallet tables that can be used to enable batch setting and removal of feeders.

PCU (Pallet Change Unit)

The PCU is used as a dolly for setting and removal of pallet tables.

3.2.3 Vision System

Parts camera

This CCD camera checks the size and shape of picked up parts.

Mark camera

A mark camera comprises a CCD camera, a light, and a mounting bracket. After the CCD camera reads the fiducial marks on the panels being produced, the coordinates are automatically corrected (offset) in accordance with internal calculations.

3.2.4 Panel Conveyance System

Carrier loader

The machine's sequencer loader conveys panels between the in-conveyor, the XY-table, and the out-conveyor, by way of panel clamp units (carriers). The in and out-carriers are both operated by air cylinders in accordance with the placing program.

In-conveyor:	Conveys the panel into the machine and transfers it to the in-carrier by means of the in-lifter.
In-carrier:	Transfers the panel from the in-conveyor to the XY-table.
XY-table:	Clamps the panel in position and moves it to and from the position for placement.
Out-carrier:	Transfers the panel from the XY-table to the out-conveyor.
Out-conveyor:	Conveys the panel to the next machine in the line.

3.2.5 Electrical Control System

Notes Regarding CP-842E/842ME Machines Operation

Absolute encoders are used on all servo motors on the machine.

The harness connectors on the servo motors should not be removed. If a harness connector is removed it will be necessary to recalibrate Proper data.

Proper data measurement is also required at the following times.

- After replacing the motor.
- After removing the cable connector from between the motor and servo amp
- If the backup battery within the servo amp is dead

Zero setting is not required on the machine.

Operation panel

The operation panel comprises switches and a touch screen monitor which are used to operate the machine.

Control box

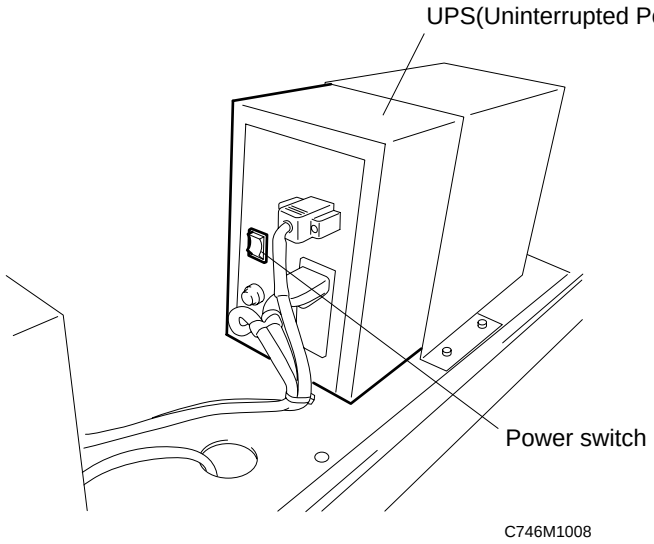
The control box contains electrical circuit boards used to control the machine. It is also equipped with a CD ROM drive which is required to install software.

Servo box (Servo BKT)

The servo box contains the servo BKT to which the servo amplifiers and boards are attached. Users should not interfere with this box, except to perform servo amplifier replacement.

UPS (Uninterrupted Power Supply Unit)

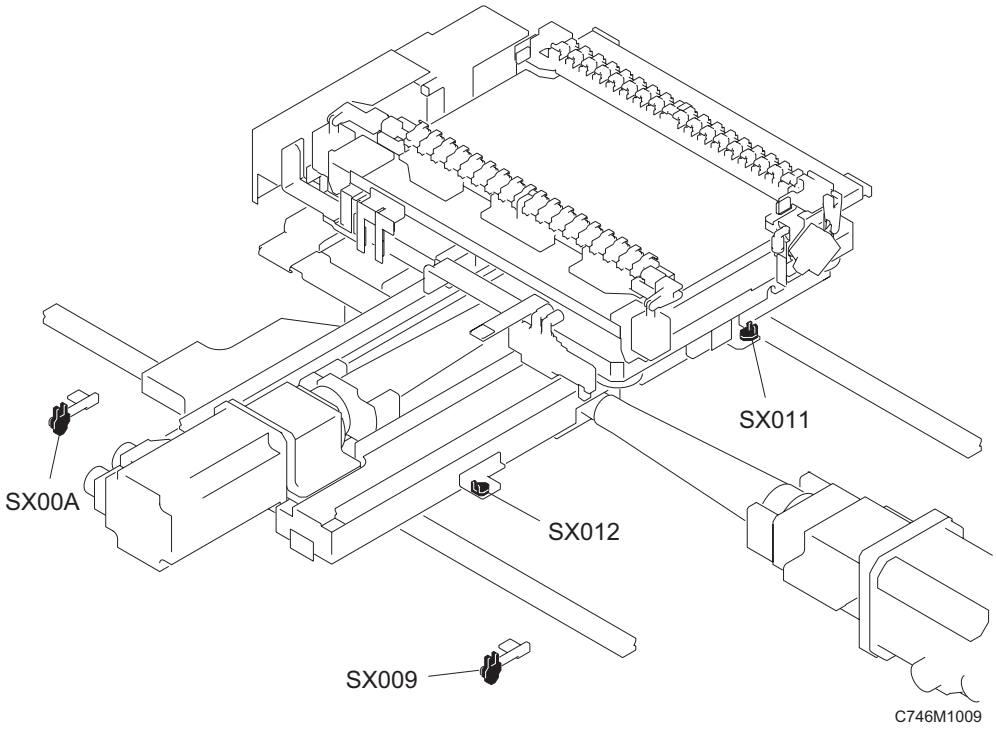
The UPS unit is positioned in the transformer box at the rear of the machine. Under normal circumstances, the power supply from the UPS is cut automatically when the machine is shut down. However, if the machine is not operating correctly, the power from the UPS unit may not always be cut. As a safety precaution when performing any kind of electrical maintenance work, always set the switch on the UPS unit to off after also cutting the main power supply to the machine.



3.3 Sensor Positions

3.3.1 XY-table

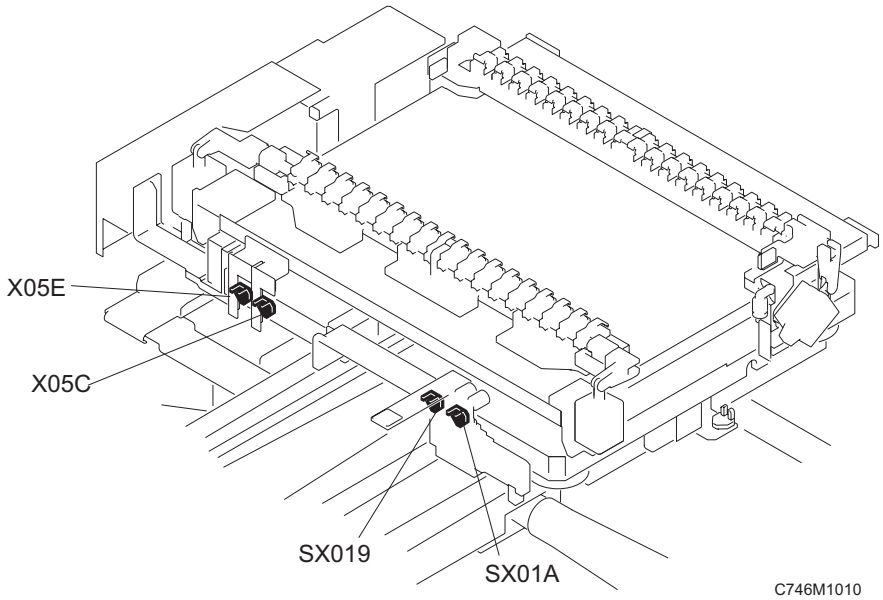
X/Y-axis



Sensor No.	SIGNAL NAME
SX009	X_AXIS_+OT
SX00A	X_AXIS_-OT
SX011	Y_AXIS_+OT
SX012	Y_AXIS_-OT

C746M1T01

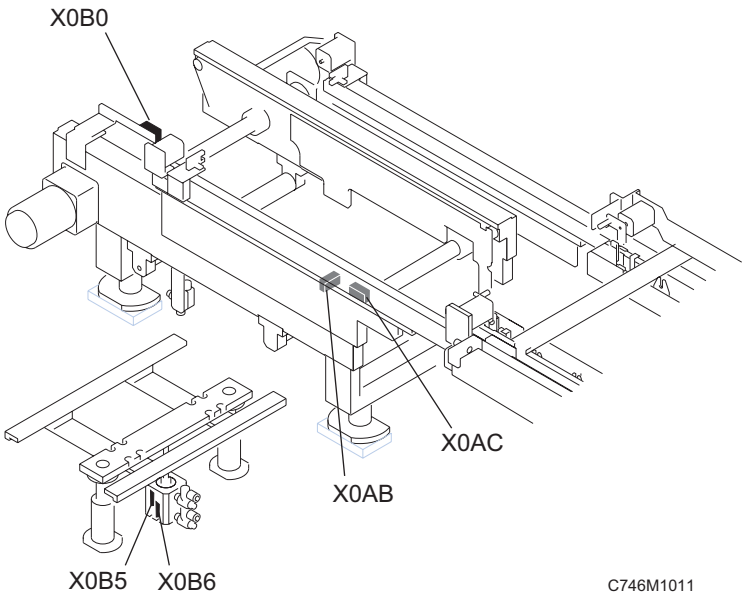
Z-axis



Sensor No.	SIGNAL NAME
SX019	Z_AXIS_+OT
SX01A	Z_AXIS_-OT
X05C	XY-TABLE LOADING HEIGHT CHECK
X05E	MAIN-LIFTER MIDDLE OT

C746M1T02

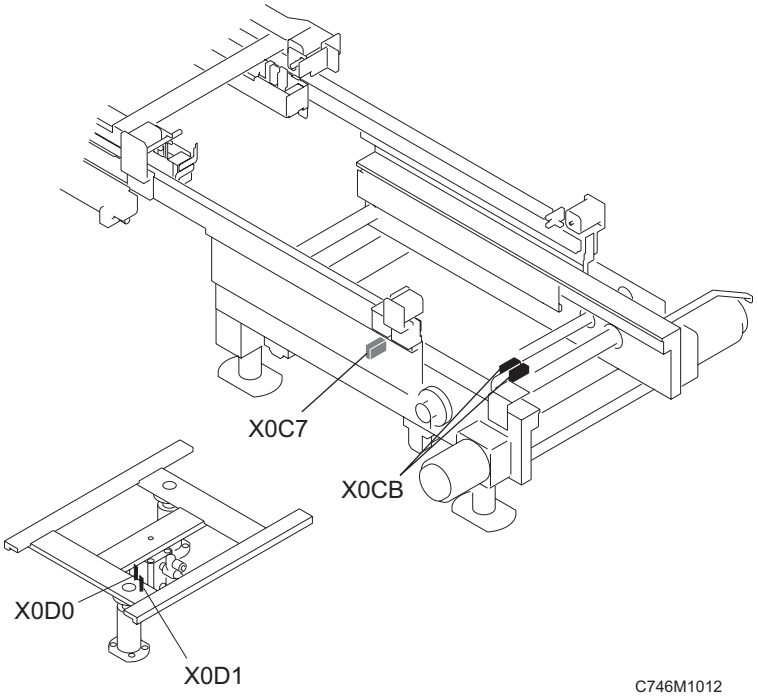
3.3.2 In-conveyor



Sensor No.	SIGNAL NAME
X0AB	IN-CONVEYOR 1 SPEED DECELERATION POINT
X0AC	IN-CONVEYOR 1 PANEL ARRIVAL CHECK
X0B0	IN-CONVEYOR PANEL IN CHECK
X0B5	IN-LIFTER UPPER LIMIT CHECK
X0B6	IN-LIFTER LOWER LIMIT CHECK

C746M1T03

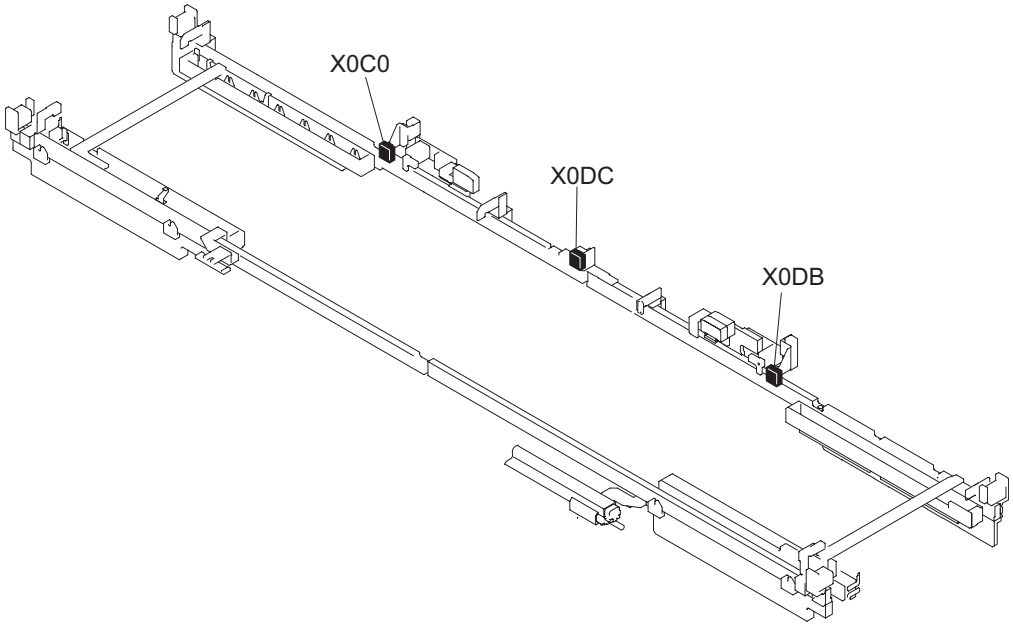
3.3.3 Out-conveyor



Sensor No.	SIGNAL NAME
X0C7	OUT-CONVEYOR 1 PANEL ARRIVAL CHECK
X0CB	OUT-CONVEYOR UNLOADER PANEL ARRIVAL CHECK
X0D0	OUT-LIFTER UPPER LIMIT CHECK
X0D1	OUT-LIFTER LOWER LIMIT CHECK

C746M1T04

3.3.4 Main Conveyor



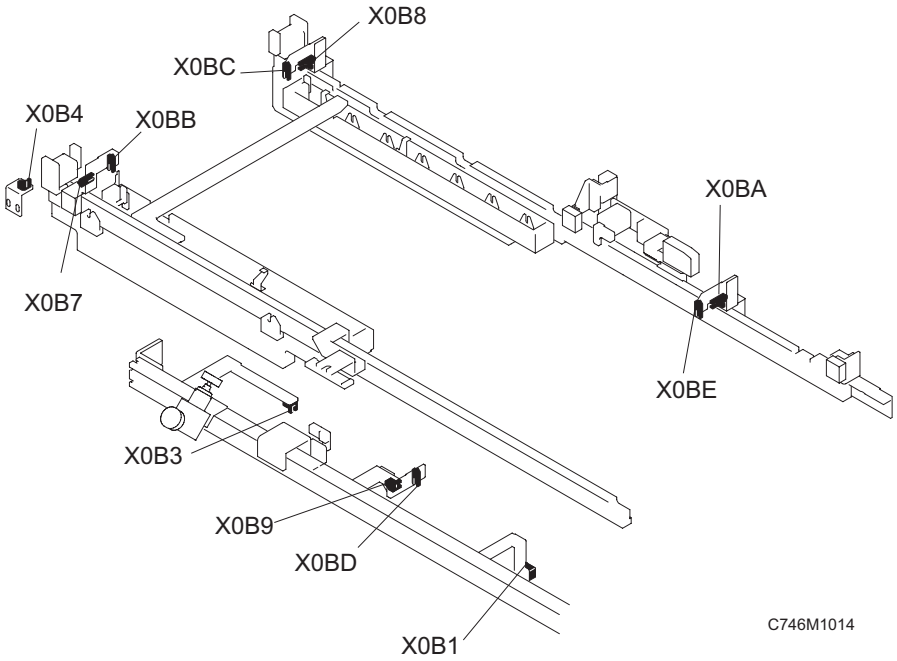
C746M1013

Note: The figure above represents a left to right panel flow.

Sensor No.	SIGNAL NAME
X0C0	ADJUSTING RAIL ENGAGEMENT CHECK (IN)
X0DB	ADJUSTING RAIL ENGAGEMENT CHECK (OUT)
X0DC	ADJUSTING RAIL ENGAGEMENT CHECK (CENTER)

C746M1T05

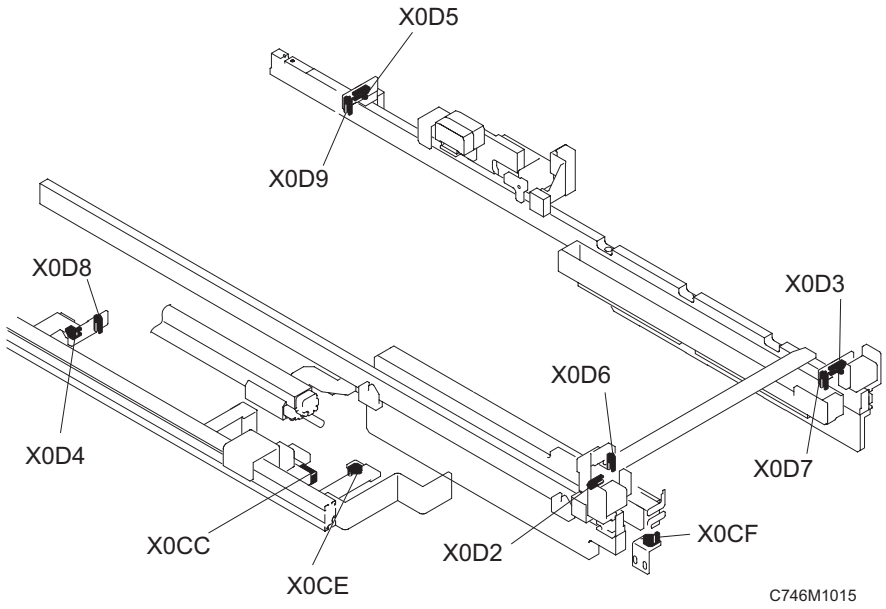
3.3.5 In-carrier



Sensor No.	SIGNAL NAME
X0B1	IN-CARRIER FORWARD LIMIT PANEL CHECK
X0B3	IN-CARRIER FORWARD LIMIT CHECK
X0B4	IN-CARRIER RETRACT LIMIT CHECK
X0B7	IN-CARRIER RETRACT LIMIT CLAMP CHECK (FIXED RAIL)
X0B8	IN-CARRIER RETRACT LIMIT CLAMP CHECK (ADJUSTABLE RAIL)
X0B9	IN-CARRIER FORWARD LIMIT CLAMP CHECK (FIXED RAIL)
X0BA	IN-CARRIER FORWARD LIMIT CLAMP CHECK (ADJUSTABLE RAIL)
X0BB	IN-CARRIER RETRACT LIMIT UNCLAMP CHECK (FIXED RAIL)
X0BC	IN-CARRIER RETRACT LIMIT UNCLAMP CHECK (ADJUSTABLE RAIL)
X0BD	IN-CARRIER FORWARD LIMIT UNCLAMP CHECK (FIXED RAIL)
X0BE	IN-CARRIER FORWARD LIMIT UNCLAMP CHECK (ADJUSTABLE RAIL)

C746M1T06

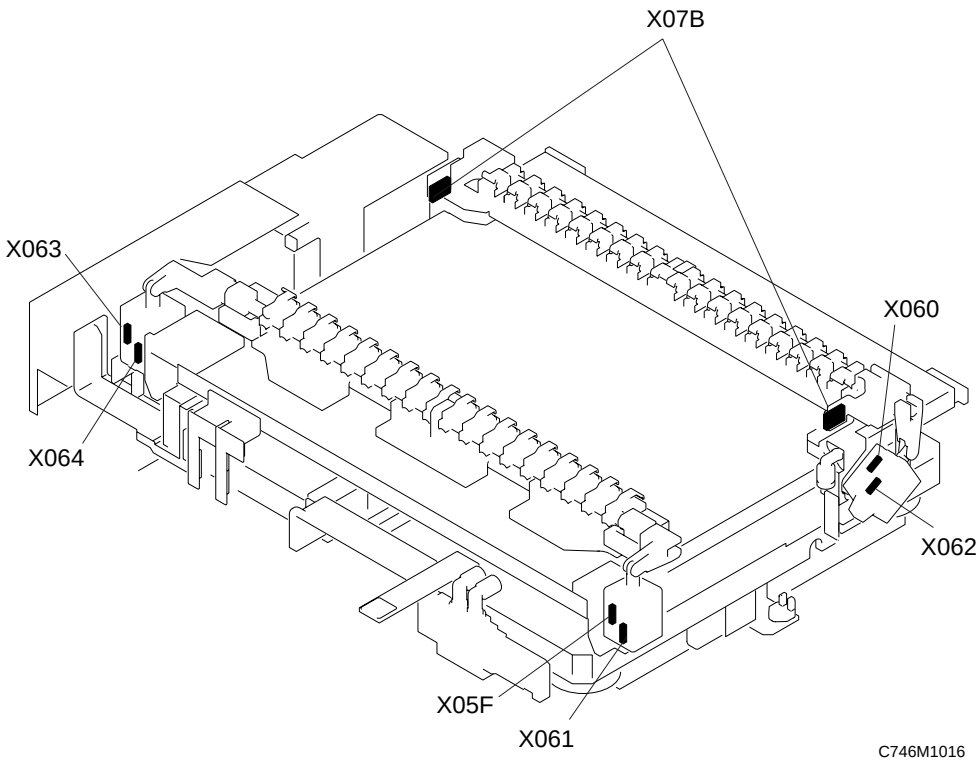
3.3.6 Out-carrier



Sensor No.	SIGNAL NAME
X0CC	OUT-CARRIER FORWARD LIMIT PANEL CHECK
X0CE	OUT-CARRIER FORWARD LIMIT CHECK
X0CF	OUT-CARRIER RETRACT LIMIT CHECK
X0D2	OUT-CARRIER RETRACT LIMIT CLAMP CHECK (FIXED RAIL)
X0D3	OUT-CARRIER RETRACT LIMIT CLAMP CHECK (ADJUSTABLE RAIL)
X0D4	OUT-CARRIER FORWARD LIMIT CLAMP CHECK (FIXED RAIL)
X0D5	OUT-CARRIER FORWARD LIMIT CLAMP CHECK (ADJUSTABLE RAIL)
X0D6	OUT-CARRIER RETRACT LIMIT UNCLAMP CHECK (FIXED RAIL)
X0D7	OUT-CARRIER RETRACT LIMIT UNCLAMP CHECK (ADJUSTABLE RAIL)
X0D8	OUT-CARRIER FORWARD LIMIT UNCLAMP CHECK (FIXED RAIL)
X0D9	OUT-CARRIER FORWARD LIMIT UNCLAMP CHECK (ADJUSTABLE RAIL)

C746M1T07

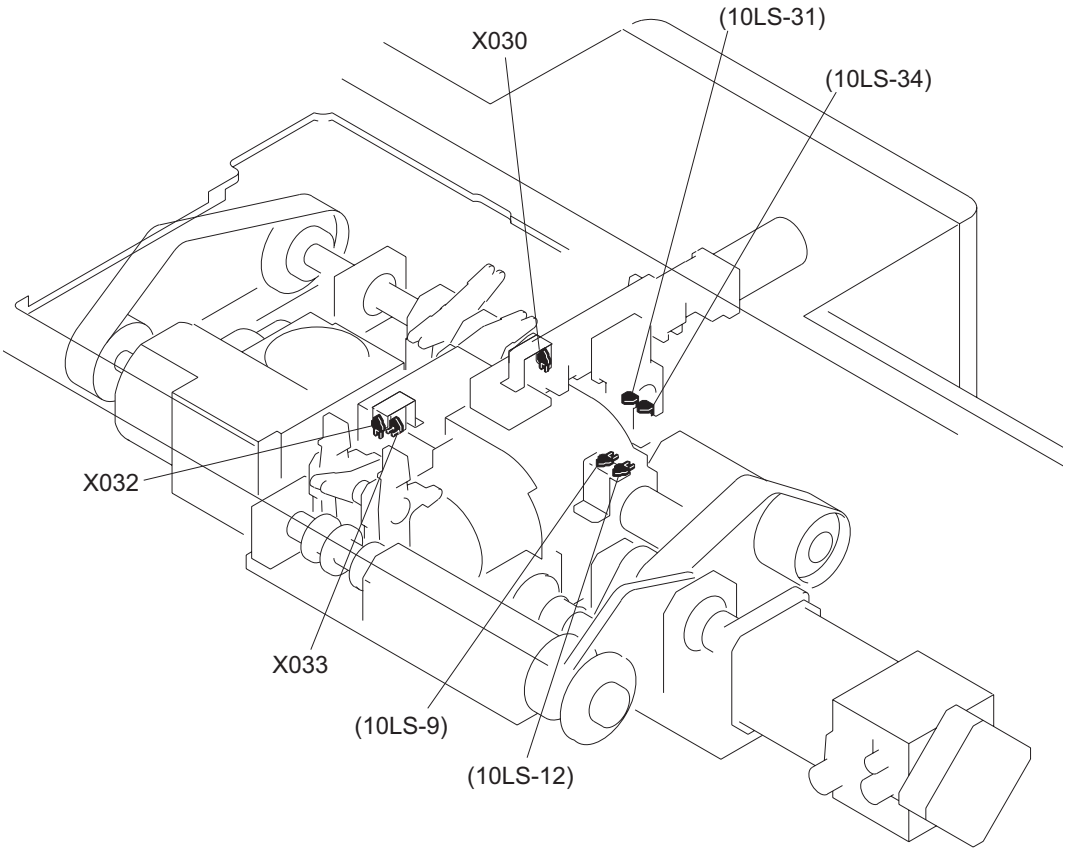
3.3.7 Panel Clamp



Sensor No.	SIGNAL NAME
X05F	XY-TABLE PANEL CLAMP CHECK (FIXED RAIL, RIGHT)
X060	XY-TABLE PANEL CLAMP CHECK (ADJUSTABLE RAIL, RIGHT)
X061	XY-TABLE PANEL UNCLAMP CHECK (FIXED RAIL, RIGHT)
X062	XY-TABLE PANEL UNCLAMP CHECK (ADJUSTABLE RAIL, RIGHT)
X063	XY-TABLE PANEL CLAMP CHECK (FIXED RAIL, LEFT)
X064	XY-TABLE PANEL UNCLAMP CHECK (FIXED RAIL, LEFT)
X07B	BACKUP PIN CHECK

C746M1T08

3.3.8 Cam Box



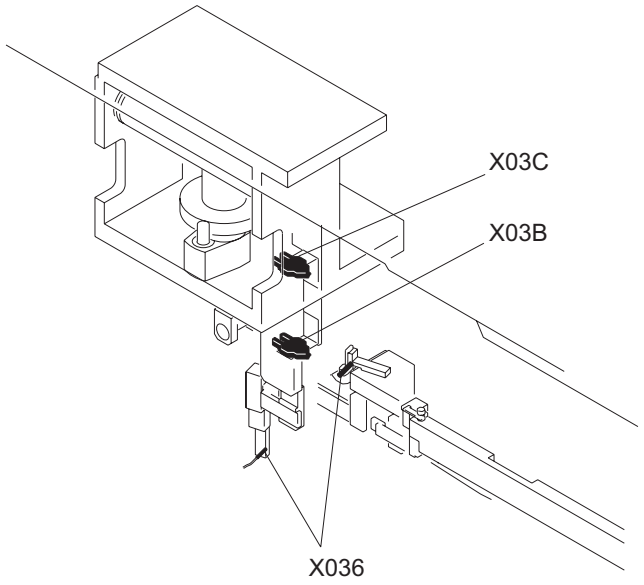
C746M1017

Sensor No.	SIGNAL NAME
X030	ST1 NOZZLE UPPER LIMIT CHECK
X032	ST9 NOZZLE UPPER LIMIT CHECK
X033	ST9 NOZZLE LOWER LIMIT CHECK
(10LS-9)	(ST5 IMAGE CHECK)
(10LS-12)	(CAM ANGLE CHECK)
(10LS-31)	(ACQUIRE PARTS HEIGHT COMMAND)
(10LS-34)	(FOREIGN OBJECTS CHECK COMMAND)

C746M1T09

Note: The items in parentheses do not display in the I/O map.

3.3.9 Tape Feeder Unit (ST1, 2)

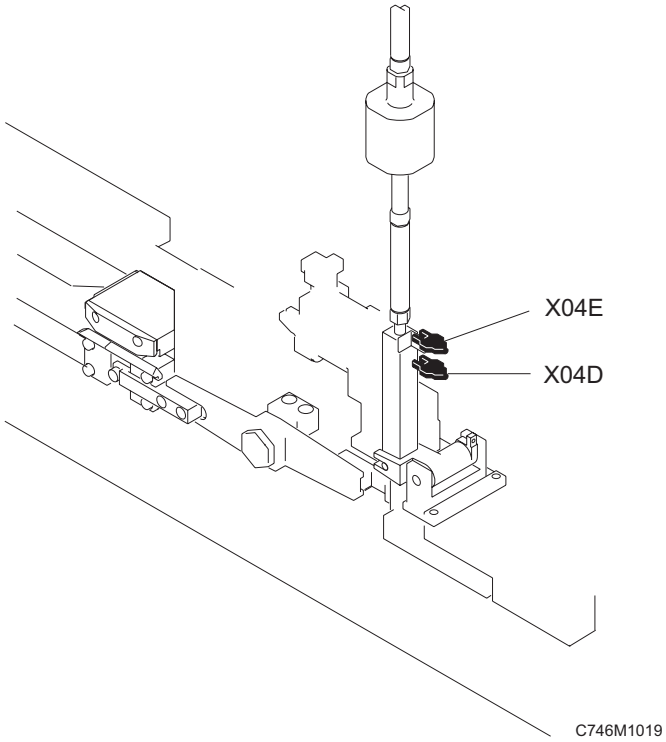


C746M1018

Sensor No.	SIGNAL NAME
X036	ST2 LARGE PART CHECK
X03B	FEEDING FORWARD LIMIT
X03C	FEEDING RETRACT LIMIT
X03D	TAPE END CHECK

C746M1T10

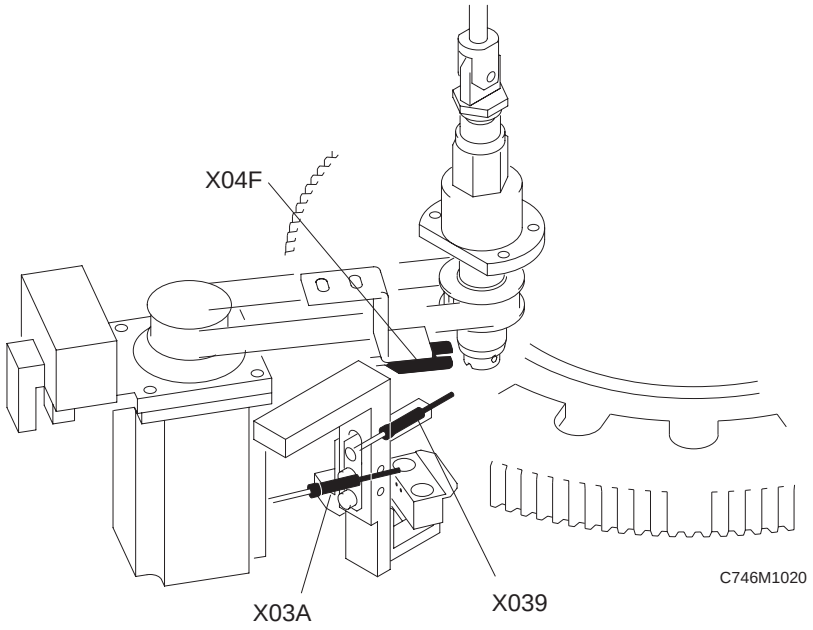
3.3.10 Tape Cutter (ST1)



Sensor No.	SIGNAL NAME
X04D	TAPE CUTTER UPPER LIMIT
X04E	TAPE CUTTER LOWER LIMIT

C746M1T11

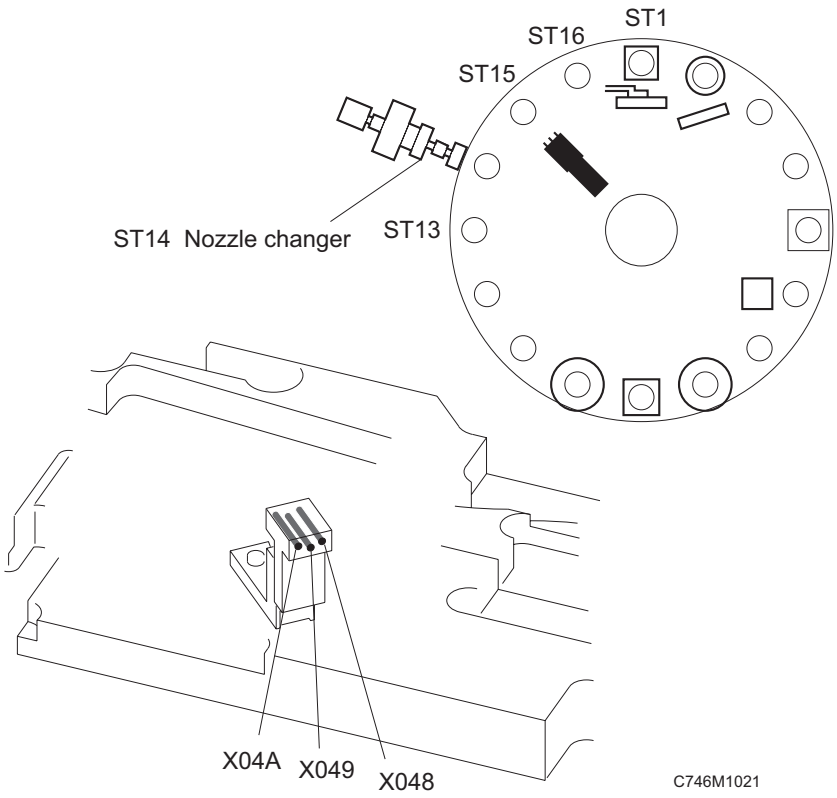
3.3.11 Nozzle Clutch (ST10)



Sensor No.	SIGNAL NAME
X039	ST10 NOZZLE CLUTCH ORIGIN POSITION
X03A	ST10 NOZZLE CLUTCH ENGAGEMENT CHECK
X04F	ST11 HEAD A CHECK

C746M1T12

3.3.12 Nozzle Changer (ST15)

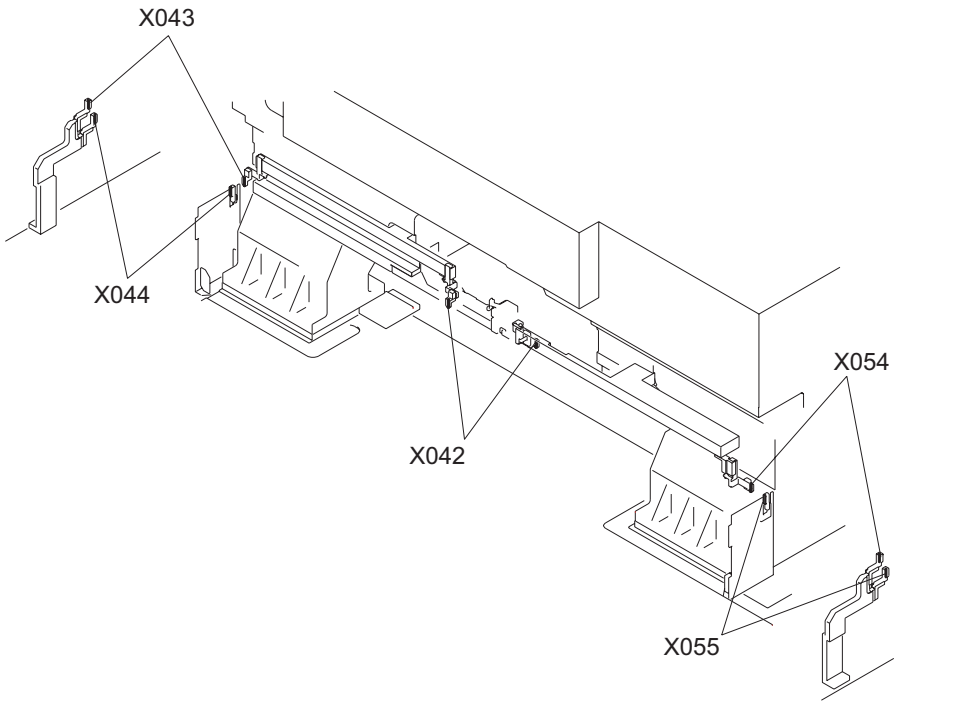


Sensor No.	SIGNAL NAME
X048	ST15 NOZZLE TYPE CHECK 1
X049	ST15 NOZZLE TYPE CHECK 2
X04A	ST15 NOZZLE TYPE CHECK 3

C746M1T13

3.3.13 Feeder Check

<CP-842E>

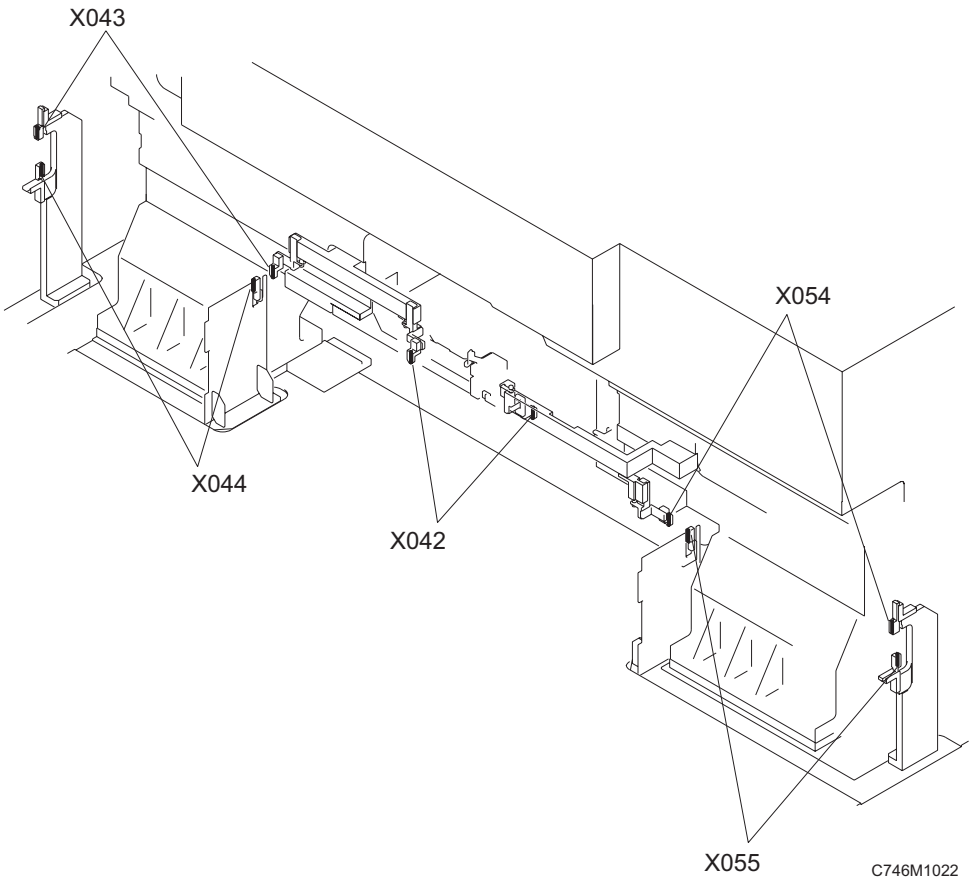


C746M1029

Sensor No.	SIGNAL NAME
X042	ST1 FEEDER CHECK
X043	D1 FEEDER CHECK UP
X044	D1 FEEDER CHECK DOWN
X054	D2 FEEDER CHECK UP
X055	D2 FEEDER CHECK DOWN

C746M1T14

<CP-842ME>

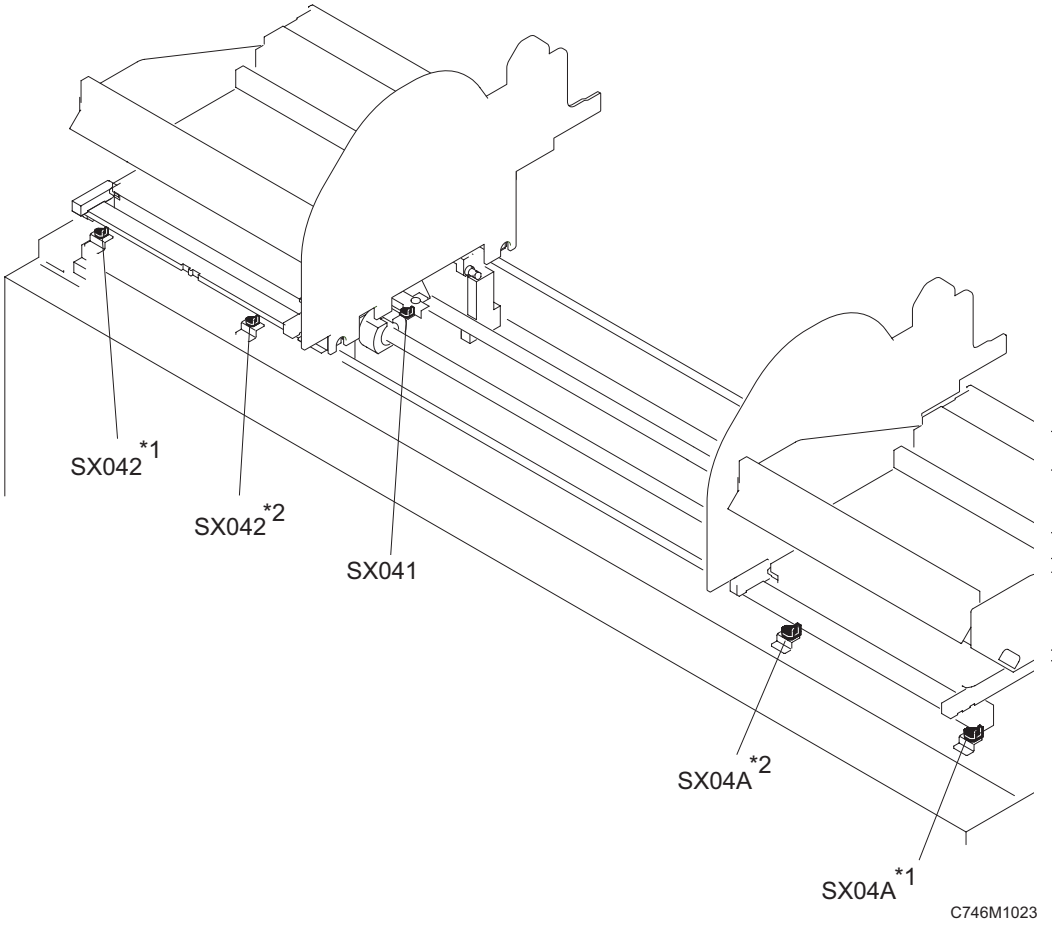


Sensor No.	SIGNAL NAME
X042	ST1 FEEDER CHECK
X043	D1 FEEDER CHECK UP
X044	D1 FEEDER CHECK DOWN
X054	D2 FEEDER CHECK UP
X055	D2 FEEDER CHECK DOWN

C746M1T14

3.3.14 Device Table

D Servo Axis

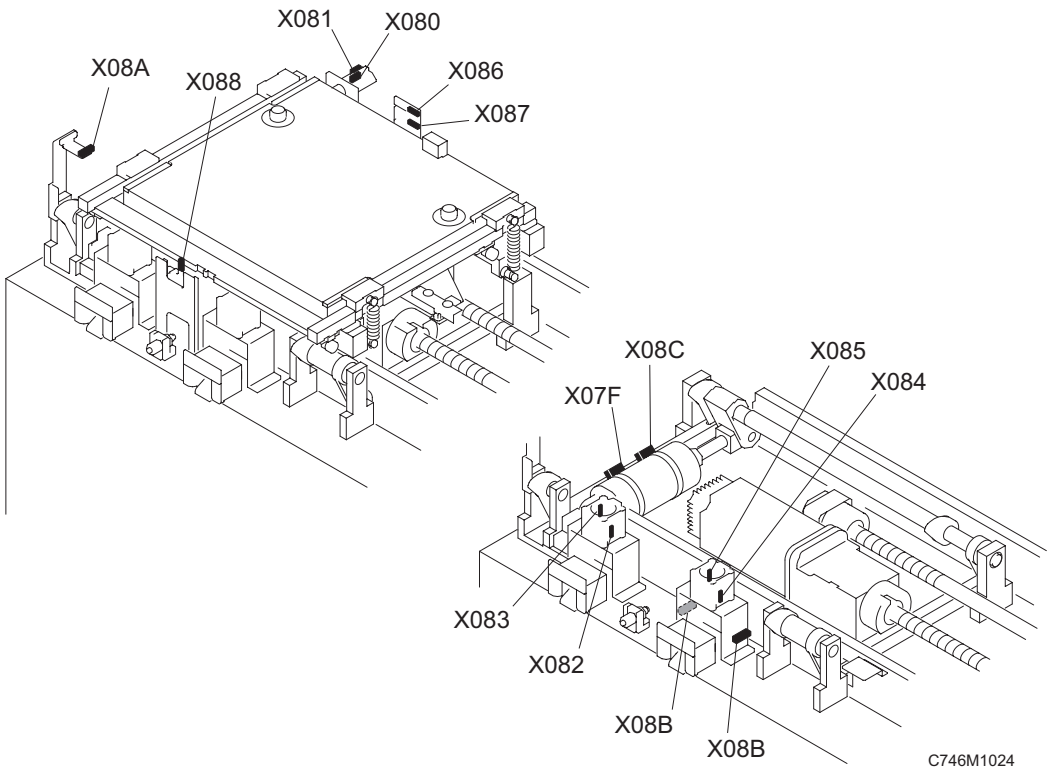


*Note: CP-842ME sensors are indicated by *1, and CP-842E sensors by *2.*

Sensor No.	SIGNAL NAME
SX041	D1_AXIS_+OT
SX042	D1_AXIS_-OT
SX04A	D2_AXIS_-OT

C746M1T15

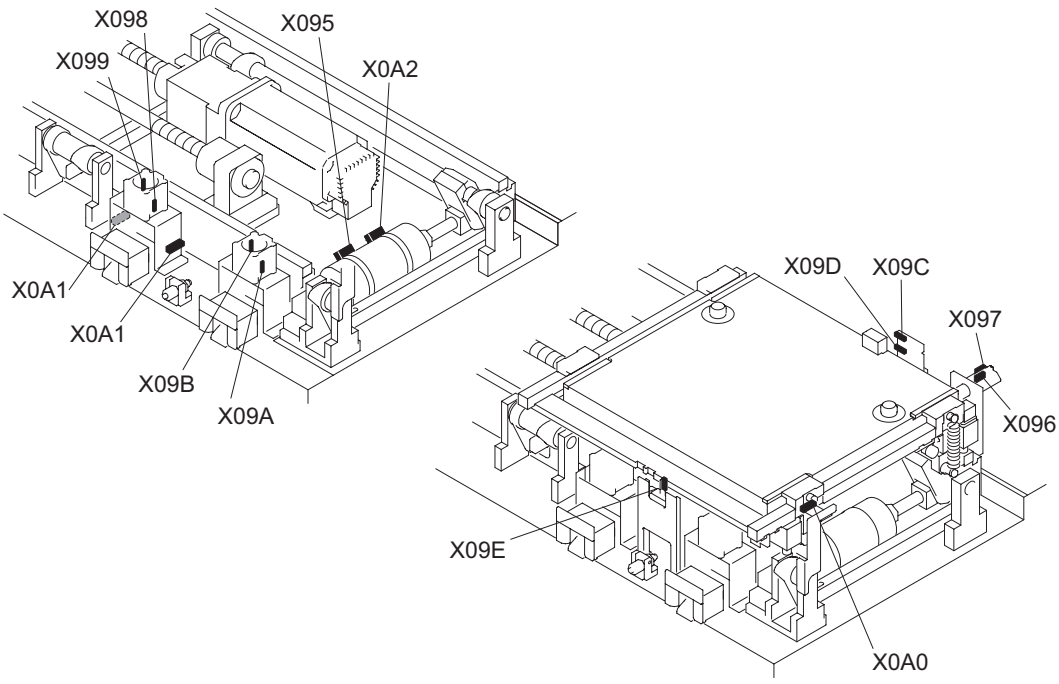
D1 Table (CP-842ME option)



Sensor No.	SIGNAL NAME
X07F	D1 CAM CYLINDER UPPER LIMIT CHECK
X080	D1 TABLE STOPPER LOCK CHECK
X081	D1 TABLE STOPPER UNLOCK CHECK
X082	D1 PCU CLAMP CHECK (1)
X083	D1 PCU UNCLAMP CHECK (1)
X084	D1 PCU CLAMP CHECK (2)
X085	D1 PCU UNCLAMP CHECK (2)
X086	D1 PALLET ARRIVE CHECK
X087	D1 PALLET SETTING CHECK (1)
X088	D1 PALLET SETTING CHECK (2)
X08A	D1 PALLET PASS CHECK (1)
X08B	D1 PCU SET CHECK
X08C	D1 CAM CYLINDER LOWER LIMIT CHECK

C746M1T16

D2 Table (CP-842ME option)



Sensor No.	SIGNAL NAME
X0CC	OUT-CARRIER FORWARD LIMIT PANEL CHECK
X0CE	OUT-CARRIER FORWARD LIMIT CHECK
X0CF	OUT-CARRIER RETRACT LIMIT CHECK
X0D2	OUT-CARRIER RETRACT LIMIT CLAMP CHECK (FIXED RAIL)
X0D3	OUT-CARRIER RETRACT LIMIT CLAMP CHECK (ADJUSTABLE RAIL)
X0D4	OUT-CARRIER FORWARD LIMIT CLAMP CHECK (FIXED RAIL)
X0D5	OUT-CARRIER FORWARD LIMIT CLAMP CHECK (ADJUSTABLE RAIL)
X0D6	OUT-CARRIER RETRACT LIMIT UNCLAMP CHECK (FIXED RAIL)
X0D7	OUT-CARRIER RETRACT LIMIT UNCLAMP CHECK (ADJUSTABLE RAIL)
X0D8	OUT-CARRIER FORWARD LIMIT UNCLAMP CHECK (FIXED RAIL)
X0D9	OUT-CARRIER FORWARD LIMIT UNCLAMP CHECK (ADJUSTABLE RAIL)

C746M1T07

4. Basic Operation

4.1 Changing the Conveyor Width

Point

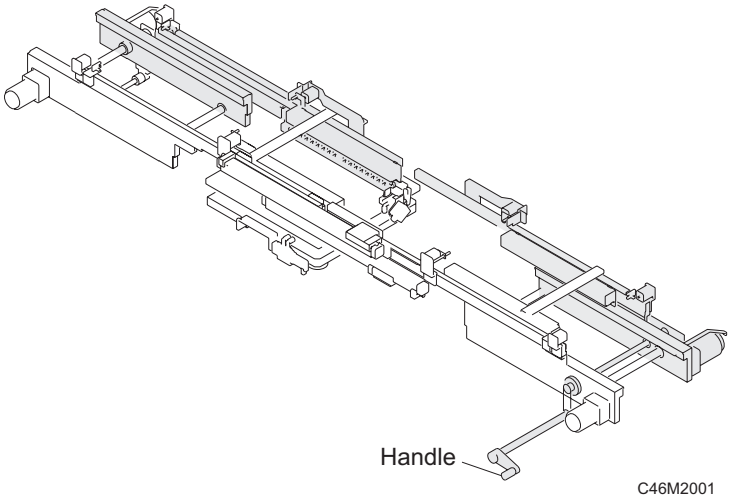
Conveyor width adjustments must be performed jointly at the in-conveyor, XY-table, and out-conveyor. The conveyors should be adjusted to a width which permits smooth panel clamping and conveyance through the machine.

Procedure

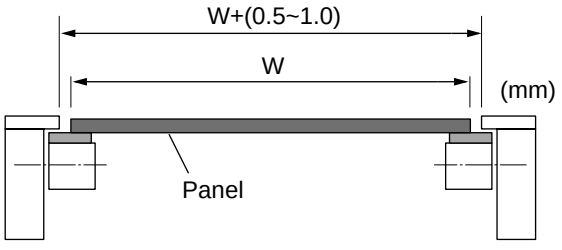
> ⚠ ***CAUTION***
>
> ***Before performing conveyor width adjustment, check the back-up pin positions on the XY-table, verifying that there will be no interference between the back-up pins and the adjustable rail.***

1 Execute the necessary commands to link the XY-table to the in and out-conveyors. At the touch panel's main screen, select the following commands: [Conveyor] - [Conveyor Width] - [Change Width], then press the START button.

2 Turn the handle on the out-conveyor to adjust the conveyor width until the panel can be conveyed smoothly. First increase the conveyor width then reduce it to between 0.5~1.0 mm wider than the panel width.



C46M2001



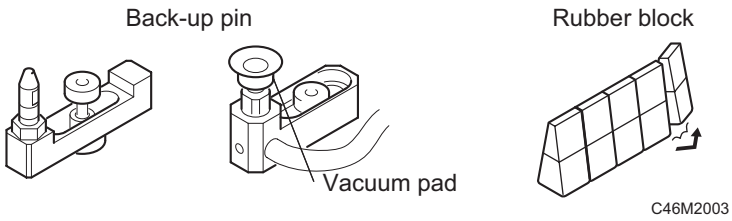
C46M2002

3 Lower the XY-table.

4 Run a test panel through the machine, verifying that it is conveyed smoothly and that panel clamping is correctly performed.

4.2 Changing the Panel Back-up Pin Positions

When the panel clamped on the XY-table warps down, position back-up pins, rubber blocks, or back-up plates under the bottom surface of the panel.



Note: Producing with the panel in a warped position may negatively impact the product.

Point

The positions and quantity of back-up pins or rubber blocks which are required depends on the panel shape and size, with consideration given to pre-mounted parts on the lower side of the panel.

For panels where upward warping is a problem, back-up pins with vacuum pads should be used to keep the panel flat.

Procedure

1 Execute the necessary commands to move the XY-table to the loading position.

2 Raise the XY-table.

3 Press the EMERGENCY STOP button.

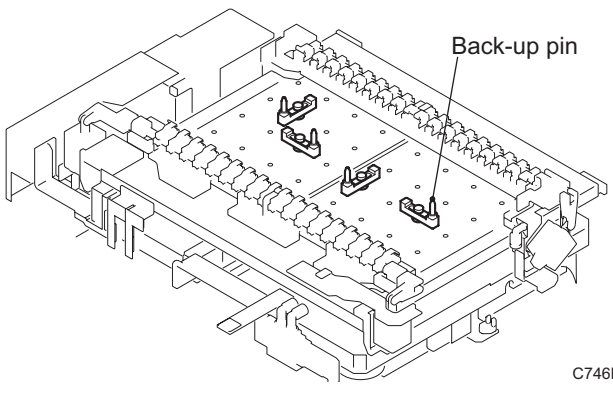
⚠ *WARNING*

Turn the main power off before performing this procedure.

4 Change the positions of the back-up pins or rubber blocks as required.

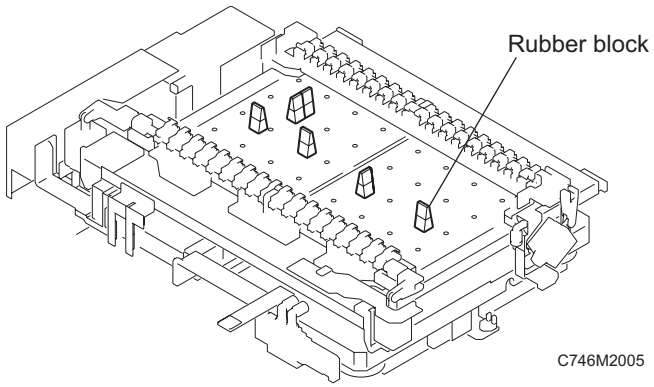
<When using back-up pins>

Loosen the pin mounting bolts and reconfigure the pins as necessary.



<When using rubber blocks>

Snap the blocks into suitable lengths and use double-faced tape to stick them to the panel lifter's back-up plate.



4.3 Setting the Feeders

Point

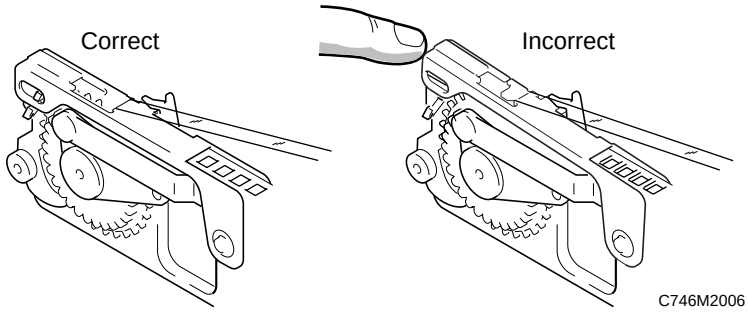
Feeders must be set on the pallets in the correct manner in order for the nozzles to pick up parts. Refer to the CP Feeders Mechanical Reference (MEC-CPFDR-x.xE) for details.

Procedure

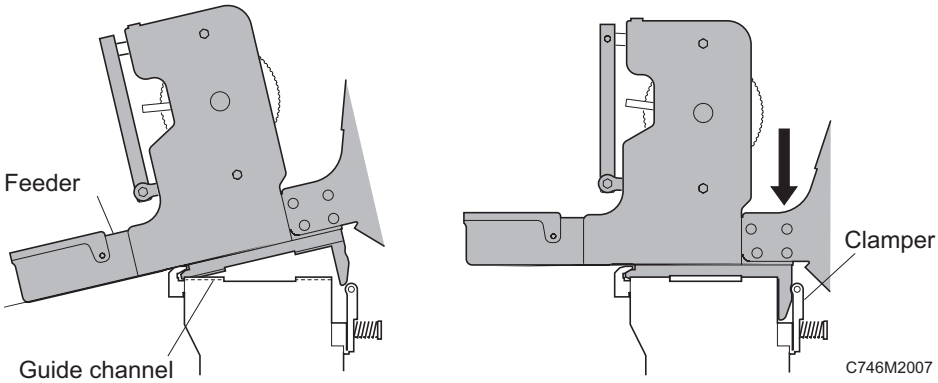
> ⚠ ***WARNING***
>
> ***Turn the main power off before performing this procedure.***

1 Verify that the tape guide is not deformed.

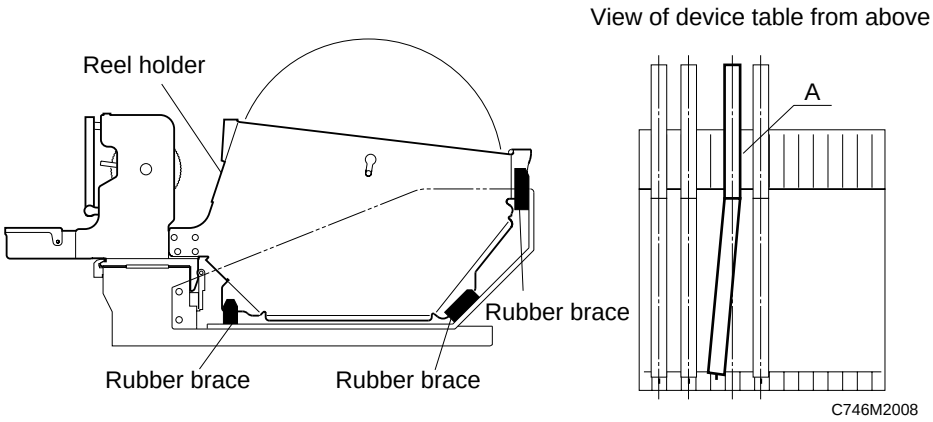
2 Place the various part tapes in their dedicated feeders. If a part tape is placed in the wrong feeder, the tape guide may not close properly.



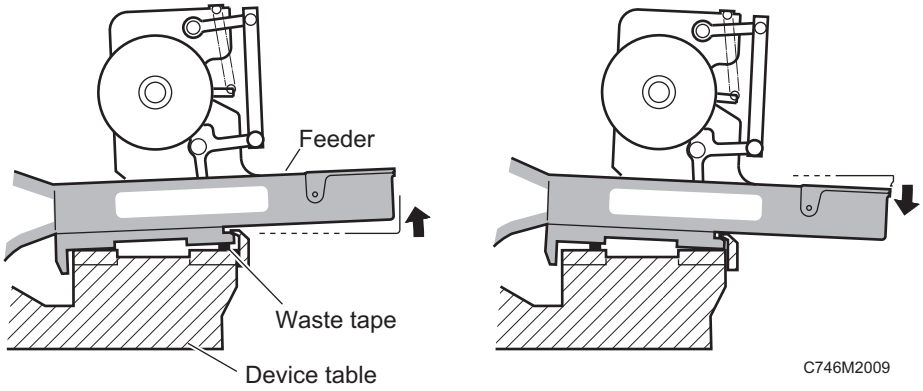
3 Insert the catch on the base of the feeder into the channel beneath the guide. Push the feeder forwards and then press the back of the feeder down to clamp it firmly in position.



13 and 15 inch parts reels should be positioned using the three rubber stoppers. When setting, ensure that the feeder base and reel itself are positioned in the same slot. Correct parts supply will not be possible if feeders are incorrectly set as shown in the figure below.



4 When setting a feeder on a device table, be sure that there is no foreign matter (waste tape, etc) between the feeder and the device table. Remove any foreign matter which has adhered to the device table grooves or to the bottom of the feeder.



4.4 Removal and Installation of Rotary Holders

Point

Remove rotary holders from the placing heads as necessary when performing maintenance such as cleaning and lubrication.

Note: The rotary holder is exclusive to the CP-842E/842ME. Do not attempt to use on any other machines.
Likewise, do not use rotary holders from other machines on the CP-842E/842ME. In particular, rotary holders from CP-7-series machines will interfere with other mechanisms around the turret and damage the machine.
Rotary holders can be identified as follows.
CP-842E/842ME: No coloring
CP-6, CP-7 machines: Colored body (anodized)

Procedure

Complete the following 3 items before removal of the rotary holder..

1 Move the rotary holder to station 9.

2 Move the XY-table towards the front of the machine to improve access.

3 Turn the machine power OFF.

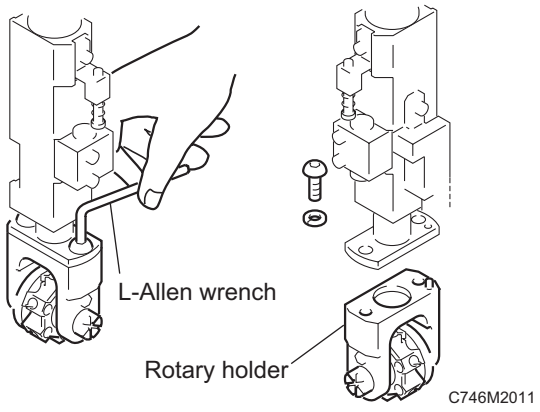
⚠ WARNING

- ***Turn the main power off before performing this procedure.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

Removal

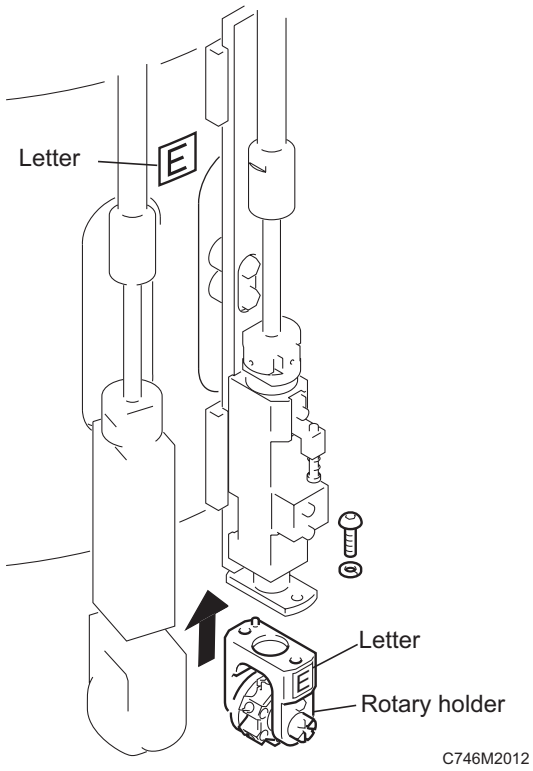
1 Loosen the rotary holder mounting bolts with an L-Allen wrench.

2 Pull the rotary holder down.



Installation

Fasten the rotary holder with the mounting bolts.
Confirm that the letter on the aluminum drum matches the letter on the rotary holder.



4.5 Changing Pallets (CP-842ME option)

Point

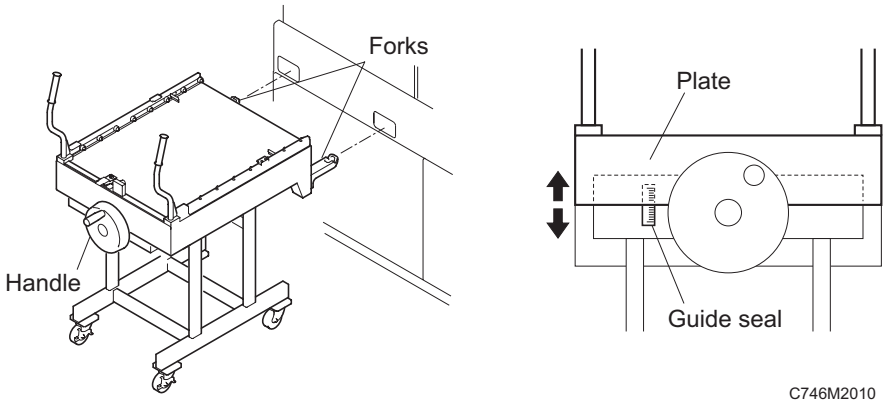
The PCU (Pallet Change Unit) enables batch changes of feeder pallets.

Procedure

Pallet unloading

1 Align the height of the PCU forks (at the end of the PCU) with the fork slots on the machine. Turn the handle and raise the upper section of the PCU.

Note: Use the guide seal at the side of the handle as a reference when adjusting the height of the forks. Adjust so that the lower surface of the plate falls within plus or minus 10 mm of the standard value.



2 Push the PCU to insert the forks into the machine, then clamp it with the [Stage1 Clamp] command.

Note: The following explanation describes the D1-axis (stage 1) pallet change.

3 Close the rear door and select the [Stage1 Start] command, then press START. The D-axis pallet moves to the change position and is unclamped.

4 Open the rear door and pull the pallet out of the machine and onto the PCU.

Caution:

1. Remove the pallet slowly.

2. To avoid damage to the door stoppers, the door should be opened and closed with care.

5 Select the [Stage1 Unclamp] touch-panel command, then slowly retract the loaded PCU.

Caution: Exercise extreme care when using the PCU to move a fully loaded pallet. A dropped pallet may result in serious injury or damage to the machine.

Pallet Loading

1. Push the fork of the PCU (containing the replacement pallet) into the machine and clamp it using the [Stage1 Clamp] command.

   Caution:Exercise extreme care when using the PCU to move a fully loaded pallet. A dropped pallet may result in serious injury or damage to the machine.

2. Push a pallet onto the machine's D-axis.

3. Close the rear door and clamp the pallet at the D-axis.

   Caution:

   1. *To avoid damage to the door stoppers, the door should be opened and closed with care.*
   2. *If the rear door is closed as the pallet is being changed, the clamp will be activated even though the pallet is not present.*

4. Select the [Stage1 Set] command.

5. Select the [Stage1 Unclamp] command, then slowly retract the PCU. This completes the pallet change.

5. Maintenance

5.1 Cleaning

5.1.1 Waste Tape Box and Filter (Every 8 Hours)

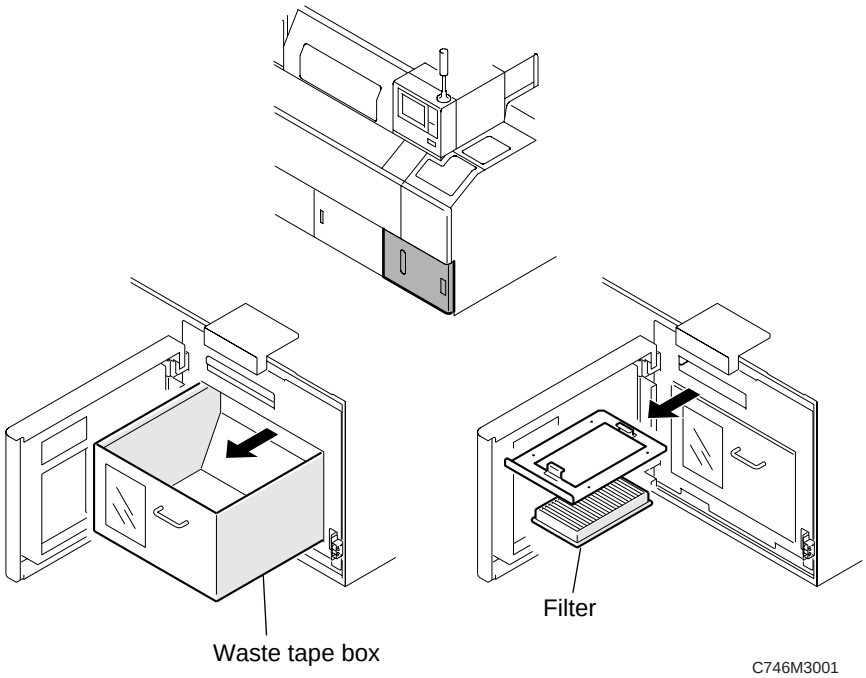
Point

Waste tape which has been cut by the cutter is carried through a duct to the waste tape box. This box should be emptied after every 8 hours of operation.

Procedure

Open the door, remove the waste tape box and empty the contents.

When emptying the waste tape box, also check the filter immediately above it. If the filter is soiled, clean it with a vacuum cleaner.



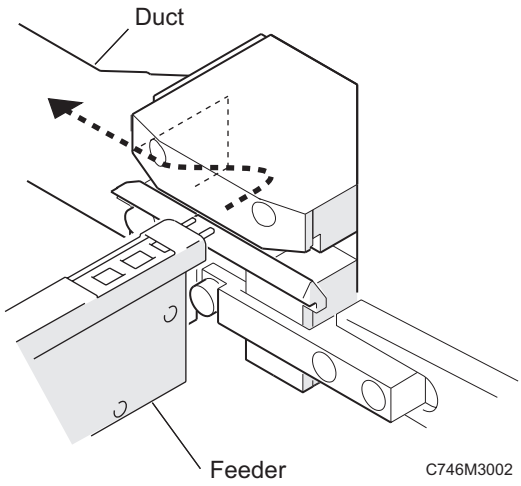
Note: When cleaning is complete, ensure that the waste tape box and filter are inserted all the way back to their original positions. Furthermore, ensure that the door is properly closed.

5.1.2 Waste Tape Duct (Every 8 Hours)

Point

After being cut by the cutter, waste tape is carried through a duct along the route shown in the figure below. Should the duct become clogged, the clogged waste tape may interfere with tape being fed from the feeder, resulting in tape feed problems and part pick-up errors.

If a tape feed problem occurs during automatic operation, inspect and clean the duct.



Procedure

⚠ WARNING

Be sure to turn the main power off before performing this procedure.

The duct should be cleaned using a vacuum cleaner (do not use an air blower).

5.1.3 Reject Parts Box (Every 8 Hours)

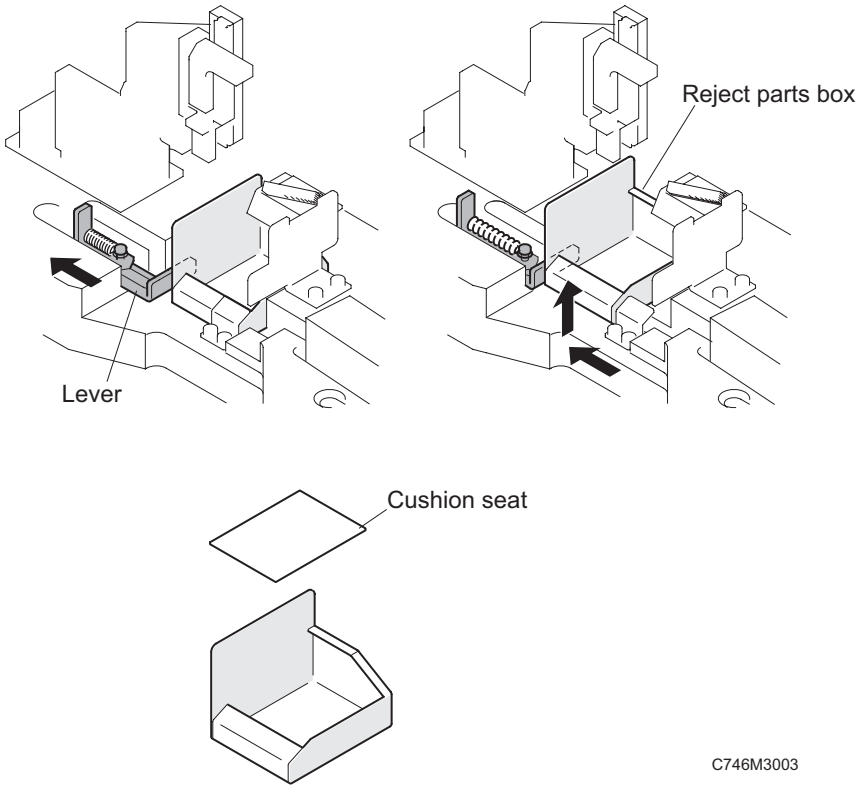
Point

Parts which have been rejected during vision processing are discarded to a reject parts box. After every 8 hours of operation, this box should be removed from the machine and emptied.

Procedure

> ⚠ ***WARNING***
>
> ***Be sure to turn the main power off before performing this procedure.***

While pulling the lever to the left, slide the reject parts box out towards the front of the machine.



When returning the reject parts box to its position, make sure that the cushion sheet exists at the bottom of the box.

5.1.4 Nozzle Interior (Weekly)

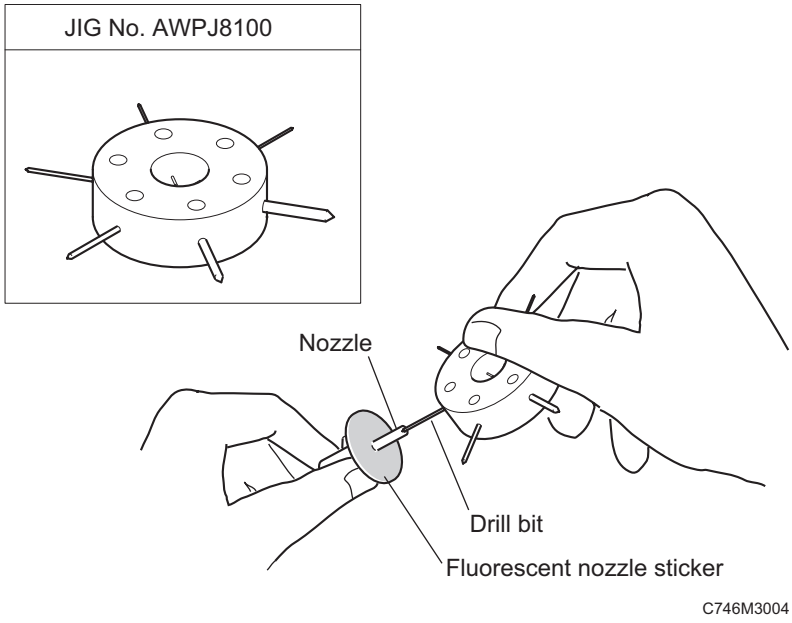
Point

Because the part is held by vacuum through the nozzle, minute dust or glue particles, etc., can build up inside the nozzle tube, causing clogging. Such clogging can reduce the nozzle suction and cause problems when picking up parts. The nozzle tube should be cleaned out weekly, or when clogging occurs.

Procedure

Use an appropriately sized drill bit to remove foreign matter from inside the nozzle tube.

When cleaning is complete, check the drill bit to ensure that dirt from the nozzle has not adhered to the tip.



Note: Jig AWPJ810 cannot be used for ø0.4 nozzles.*

Caution:

1. Take care to avoid bending the nozzle.

2. Take care to avoid dirtying the surface of the fluorescent sticker.

5.1.5 Camera Glass (Weekly)

Point

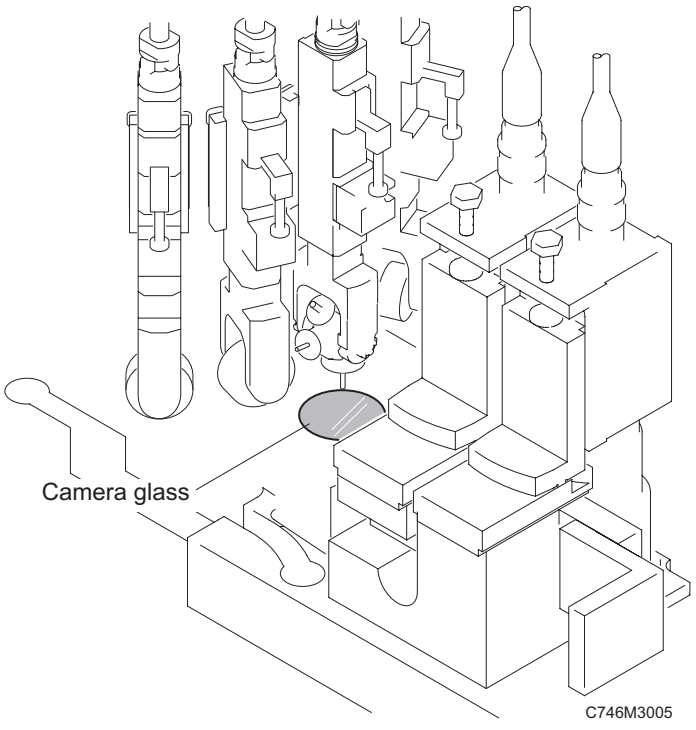
The camera glass should be cleaned once a week to ensure that a clear image is being acquired. This also contributes to stable vision processing and part pick-up operations.

Procedure

> ⚠ ***WARNING***
>
> ***Be sure to turn the main power off before performing this procedure.***

Use a soft brush (such as those used to clean camera lenses) to clean the camera glass. If the glass is badly soiled, use a commercially available glass cleaner.

> ⚠ ***CAUTION***
>
> ***• Take care not to bend the nozzle by touching it at the tip.***
> ***• Because the camera glass is thin and easy to break, do not push hard when wiping it clean.***



5.1.6 Filter Regulator (Weekly)

Point

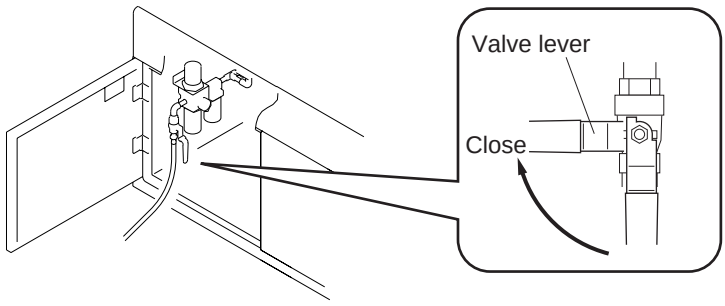
The air that flows through the system's air lines must always be clean. A soiled filter regulator makes it impossible to supply clean air, and can cause equipment failure.

Procedure

> ⚠ ***CAUTION***
>
> ***Be sure to turn the main power off before performing this procedure.***

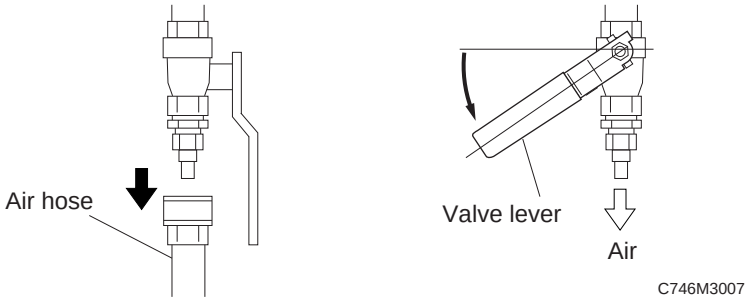
Be sure to turn the air supply off and to release the air pressure in advance.

1 Close the air inlet valve lever and cut the external air-supply.



C746M3006

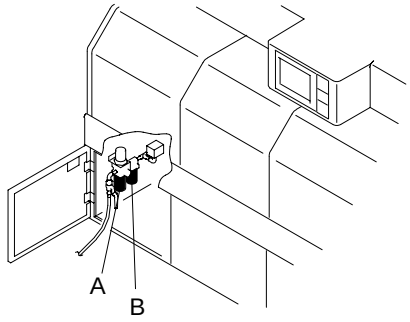
2 Reduce the pressure in the air hose.
After disconnecting the air hose, return the valve lever slowly to the position indicated in the illustration below to expel the air from the air inlet.Reduce the pressure in the air hose.

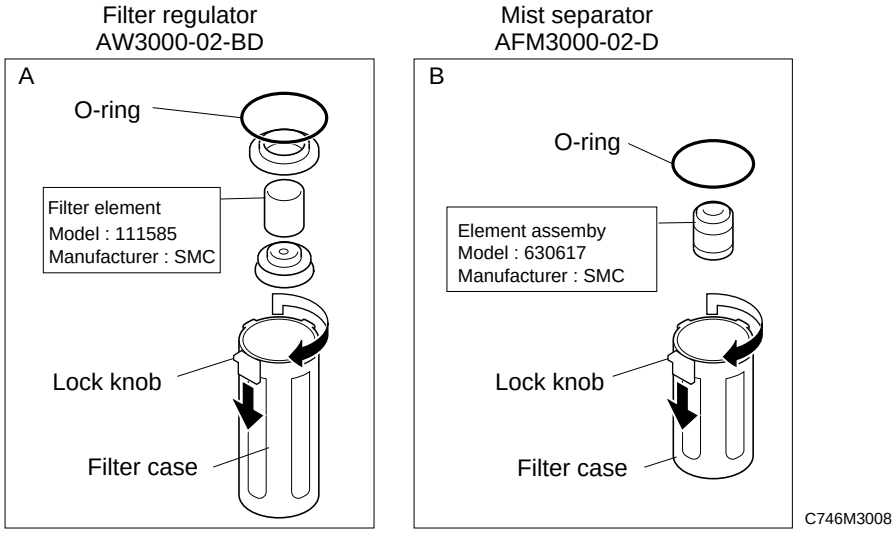


C746M3007

3 Close the valve lever again when the air has been fully expelled.

Next remove the filter case and clean the filter element.





4 Disconnect the drain hose from the regulator if there is any.

5 Remove the filter case.While pressing the lock down, turn to remove the filter case.

6 Remove the drainage collected in the filter case and wash the case with neutral detergent.

7 Remove and clean the element.

Note: The element should be replaced every 2 years.

Assemble the filter regulator after cleaning, attach the air-hose, and open the valve lever fully.

5.1.7 Machine Interior (Weekly)

Point

Chip parts and other foreign objects will accumulate in the machine during the course of operation. Such objects should be removed from the machine periodically to keep the machine in good working order.

Procedure

> ⚠ ***WARNING***
>
> ***Be sure to turn the main power off before performing this procedure.***

1 Use a vacuum cleaner to remove the foreign objects from the machine interior.

2 Use a dry cloth to wipe grease off of all areas not specified as lubrication points.

Caution: Do not use an air gun within the machine as dust or other small fragments may be blown into other areas of the machine.

5.1.8 Part Height Check Sensor Lens (Weekly)

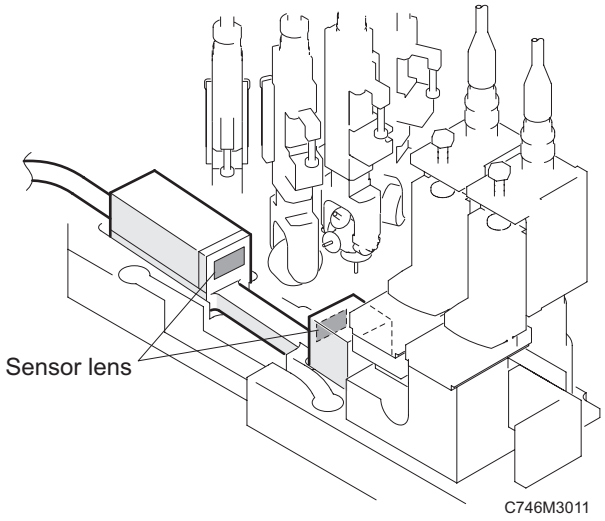
Point

The lenses should be cleaned periodically to ensure accuracy during part height and nozzle length measurement.

Procedure

> ⚠ ***WARNING***
>
> ***Be sure to turn the main power off before performing this procedure.***

Use a soft brush (such as those used to clean camera lenses) to clean the sensor lens. If the lens is badly soiled, use a commercially available lens cleaner.



5.1.9 Fluorescent Nozzle Stickers (Monthly)

Point

Dust and other particles adhere to the nozzle fluorescent sticker, reducing the amount of light reflected to the ST5 parts camera. A reduced reflection can prevent the part image from being acquired properly, resulting in vision errors.

Procedure

If repeated vision errors are occurring for a particular nozzle, use a soft brush (such as those used to clean camera lenses) to wipe the dust from the sticker.

Note: Do not rub the fluorescent seal with a cloth, as this will cause dust to adhere to it. If the dust cannot be removed, replace the fluorescent seal.

5.1.10 Tapered Clutch on the Nozzle Indexing Shaft (Monthly)

Point

After extended periods of operation, grease may adhere to the tapered clutch area of the nozzle indexing shaft, causing the clutch to slip. This slippage makes it difficult to rotate the nozzle to its placing angle, and affects the positioning. Use the degreasing agent (ThreeBond 2706) supplied with the machine to clean the tapered clutch on a monthly basis.

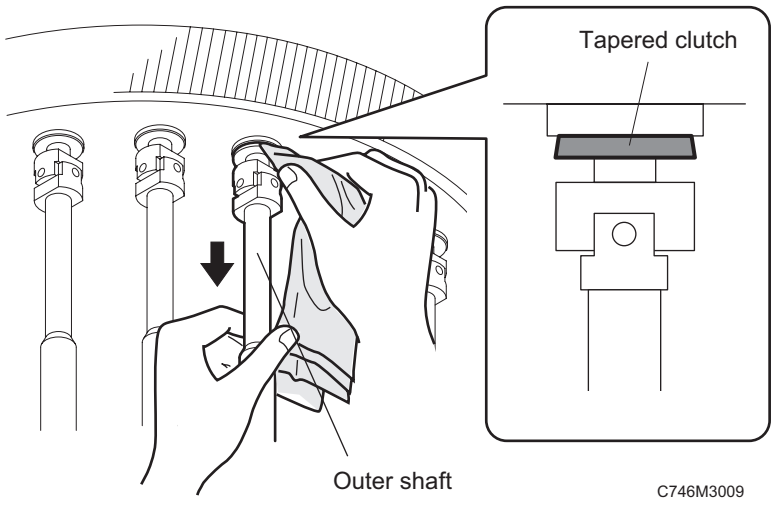
Procedure

⚠ *WARNING*

- ***Turn the 200V power off before performing this procedure.***
- ***Rotation may occur (caused by spring action) if the cam axis is not at its origin position (0-degrees). Use special care when working inside the machine as this is a dangerous area.***

While pulling down the outer shaft which covers the nozzle indexing shaft, wipe the tapered clutch (all the way around) with a cloth on which the degreasing agent has been applied.

Note: Do not spray the degreasing agent directly onto the tapered clutch, because spraying is inaccurate. (The agent could land on other components, removing the lubricant which they require.)



5.1.11 Air Filter (Monthly)

Point

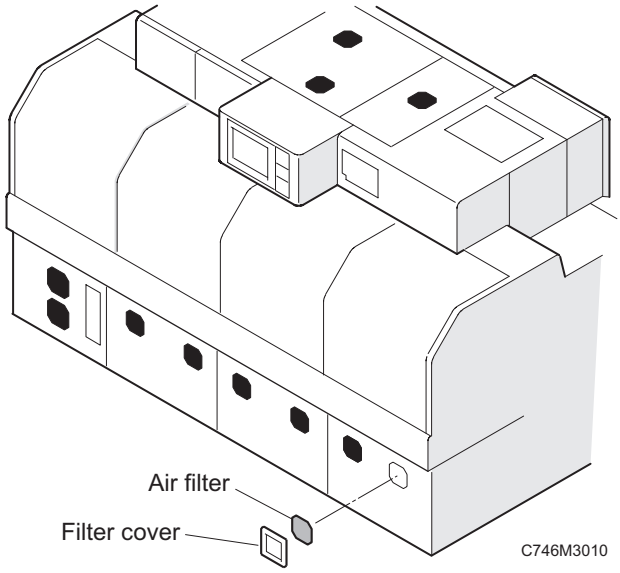
Filters are attached to each of the cooling fans on the machine. The air filters should be cleaned periodically to ensure smooth passage of air and thus prevent overheating.

Procedure

⚠ *WARNING*

Be sure to turn the main power off before performing this procedure.

Remove the cover and the filter and then use a vacuum cleaner to remove any particles from the filter.



5.1.12 Oil Cooler Air Filter (Monthly)

Point

A filter is attached to the oil cooler unit. The air filter should be cleaned periodically to prevent damage to the machine as a result of blockage.

Procedure

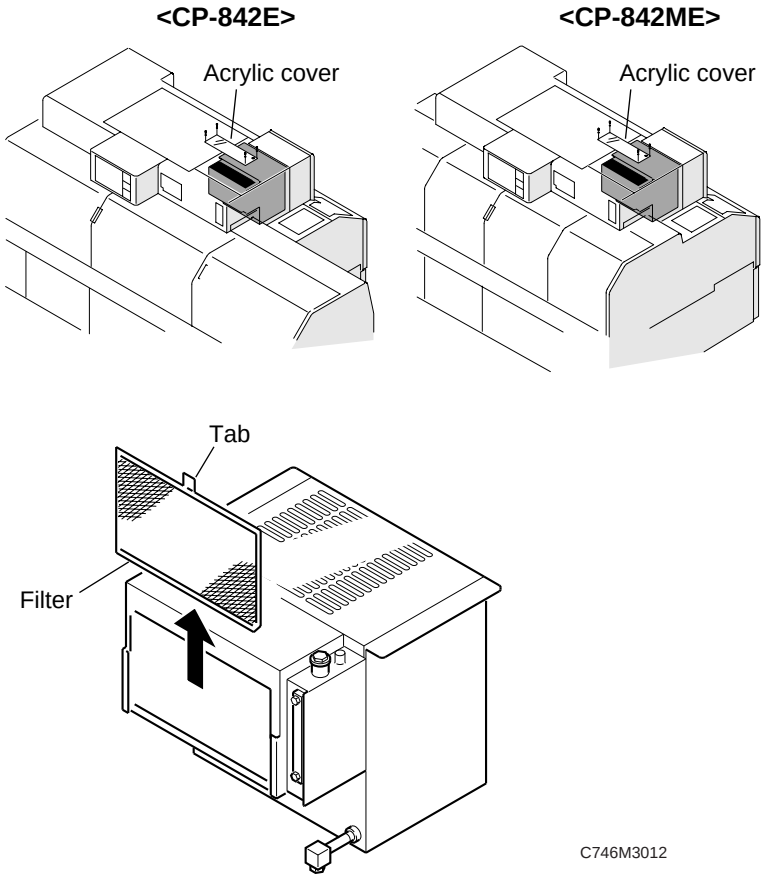
⚠ *WARNING*

Be sure to turn the main power off before performing this procedure.

1 Remove the acrylic cover from the top of the machine.

2 Hold the tab and lift the filter upwards to remove.

3 Clean the filter with a vacuum cleaner.



5.1.13 Carrier Rodless Cylinder (Monthly)

Point

There is a tendency for scattered parts and fine fibers etc. to adhere to the slide surface of the rodless cylinder used to drive the carrier. As a result, it is necessary to perform periodic cleaning.

Procedure

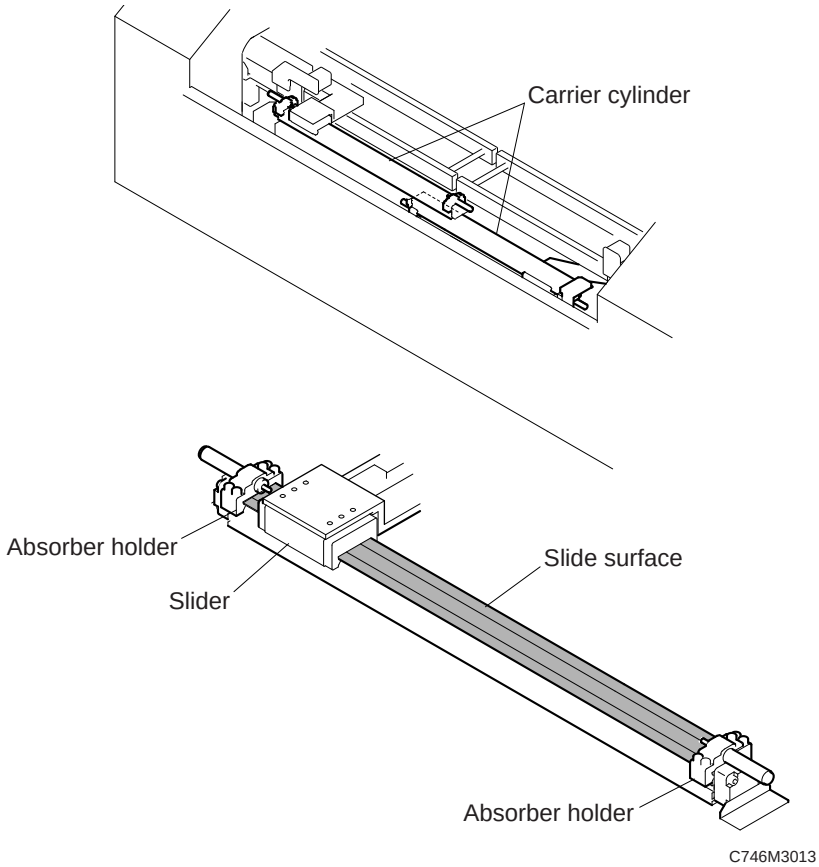
⚠ *WARNING*

Be sure to turn the main power off before performing this procedure.

1 Lightly wipe the slide surface of the rodless cylinder using a fine cloth. Furthermore, ensure to remove any dirt etc. that has accumulated between the ends of the slider surface and the absorber holder.

2 Apply some grease to a fine cloth and wipe along the slider surface.

Note: Ensure to use Daphne Eponex No. 2 by Idemitsu.



5.1.14 Nozzle Filter (Every 3 Months)

Point

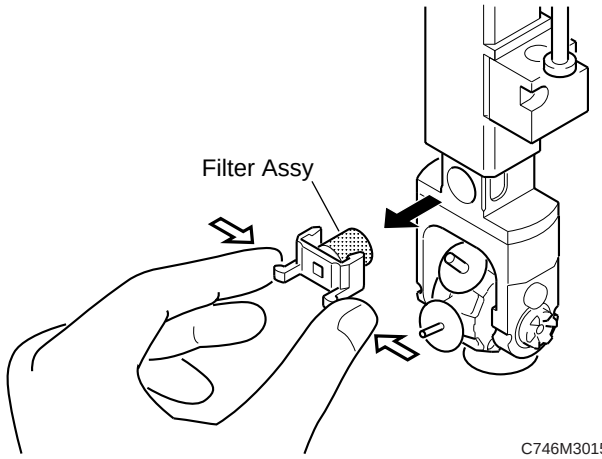
The filter inside the shaft becomes soiled during the course of machine operation, and should be replaced approximately every 3 months. If errors occur frequently for a specific nozzle, it is probable that the flow of air is being impeded by a dirty filter.

Procedure

⚠ *WARNING*

Be sure to turn the main power off before performing this procedure.

1 Squeeze in the levers shown in the figure below, and carefully extract the filter.

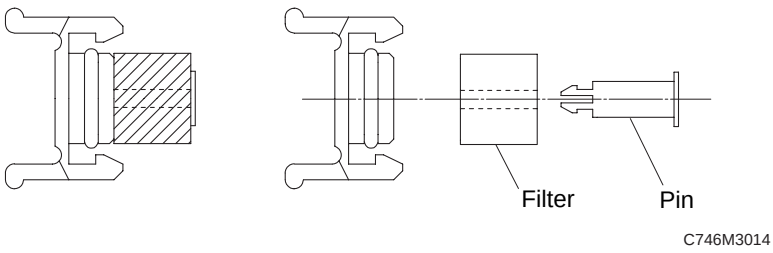


Caution:

1. Do not apply excess force to the nozzle shaft.

2. Ensure that the filter is returned to the nozzle with the levers at the bottom.

2 Remove the pin from the filter Assy, and replace both the filter and the pin.



5.1.15 Cleaning Checklist

Cleaning points		Schedule	Check
1	Waste Tape Box and Filter	Every 8 Hours	
2	Waste Tape Duct	Every 8 Hours	
3	Reject Parts Box	Every 8 Hours	
4	Nozzle Interior	Weekly	
5	Camera Glass	Weekly	
6	Filter Regulator	Weekly	
7	Machine Interior	Weekly	
8	Part Height Check Sensor Lens	Weekly	
9	Fluorescent Nozzle Stickers	Monthly	
10	Tapered Clutch on the Nozzle Indexing Shaft	Monthly	
11	Air Filter	Monthly	
12	Oil Cooler Air Filter	Monthly	
13	Carrier Rodless Cylinder	Monthly	
14	Nozzle Filter	Every 3 Months	

T015

5.2 Lubrication

5.2.1 Precautions During Lubrication

- Prior to beginning any lubrication, turn the main breaker off.
- Apply an appropriate amount of lubricant. If too much lubricant is applied, it may splatter and drop on panels inside the machine. Special care should be taken to keep the camera lens clean, as a soiled lens results in poor part inspection results. Use a lens cleaner to keep the lens clean.

5.2.2 Types of Lubricant

The lubricants which are used have the following characteristics.

Type	Characteristics
Daphne Eponex No. 2	Lithium grease by Idemitsu suited to mid/low speed parts.
Daphne Super Multi Oil 32	High grade synthetic based oil by Idemitsu used as a multi-purpose lubricating oil applicable to a wide range of parts that require lubrication.
Multemp LRL3	Lithium grease by Kyodo Oils suited to mid/low speed parts.
Multemp SRL	Lithium grease by Kyodo Oils suited to high/mid/low speed parts.
AFC Grease	High grade synthetic oil based on grease by THK suited to high speed parts.
SHC 630	This MOBIL, PAO based oil is used on gears and axis components.
Turbine oil + NASKALUBE	A Fuji special blend containing additives, used for the purpose of enhancing durability.

C746M3T02

Note: Do not mix grease types.

Grease Gun Kit

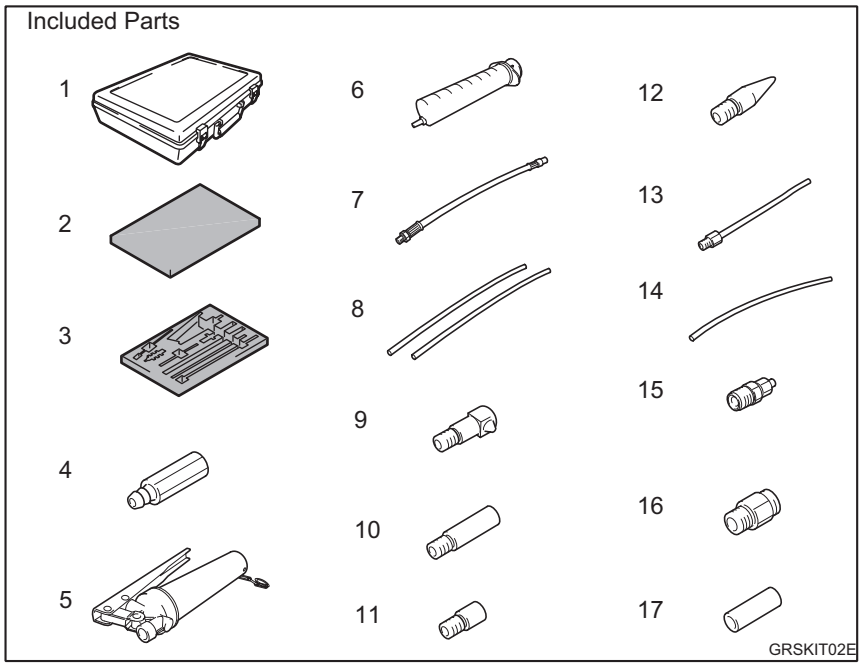
A grease gun kits with which grease supply for almost all Fuji equipment can be performed is available from Fuji. The grease gun kit comes with all the nozzles required to apply grease to the various grease nipple formats. To obtain the grease gun kit, please contact your Fuji agent.

FUJI Grease gun kit contents:

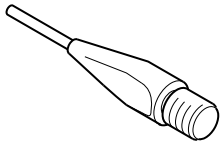
Name: Fuji grease gun kit
Code: AWPJ820*

No.	Name	Code	Format	Quantity
1	Box Sheet	PJ	EA506J	1
2	Sheet	WPJ1271	PE light (Sponge)	1
3	Sheet	WPJ1281	Polyurethane	1
4	Mushroom Nipple	WPJ1261		1
5	Grease Gun	K1153F	KH-120 (with HSP-1)	1
6	Syringe	S2184A	SJ-S30S	1
7	Rubber Hose	H5456T	SPK-3C	1
8	Air Hose	T2063H	TU0604B-310 mm	2
9	Nozzle	N5004A	L-type	1
10	Nozzle	N5005A	N-type	1
11	Nozzle	N5006A	N-1-type	1
12	Nozzle	N5007A	P-type	1
13	Nozzle	N5008A	U-type	1
14	Tube	T2061E	PTFE tube 2x3-150 mm	1
15	Connector	K5030T	PN-1/8-PT1/8-BS	1
16	Connector Nipple	S2176B	TS6-01	1
17	Sleeve	S3084A	40-13	1

GRSKIT01E

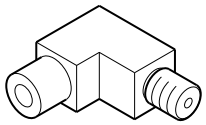


The CP-842E/842ME series requires the following grease nozzles, which are not included in the standard grease gun kit.



Nozzle for NG parts disposal unit and NY-axis LM blocks

DGPJ055*



Nozzle for NZ-axis LM blocks

ADGPJ818*

C746M3039

5.2.3 Lubrication Instructions

Illustrations and tables are used to indicate important information about keeping the machine properly lubricated.

Type and Schedule for Lubrication

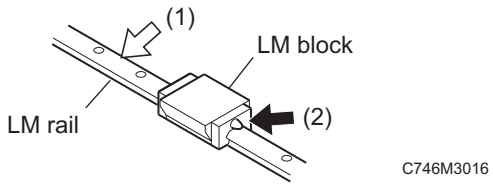
Within these illustrations, symbols are used to indicate the location, type and schedule for lubrication.

The lubrication schedules are based on eight hours of operation per day, five days per week (40 hours) and 20 days per month (160 hours). However, if the machines are being operated in two or three shifts per day, the lubrication schedules should be used as follows.

Daily:	Eight hours from when the machine is turned on, after every eight hour shift, or after one day's operation.
Weekly:	After 40 hours of operation, whether the machine is being used in two or three shifts, or after one week's operation.
Monthly:	After 160 hours of operation, whether the machine is being used in two or three shifts, or after one month's operation.
Every 3 months:	After 480 hours of operation, whether the machine is being used in two or three shifts, or after three month's operation.
Every 6 months:	After 960 hours of operation, whether the machine is being used in two or three shifts, or after six month's operation.
Annually:	After 1920 hours of operation, whether the machine is being used in two or three shifts, or after a year of operation.

Locations for Lubrication

Locations for lubrication are indicated in the illustrations using arrows and numbers. White arrows are used to indicate surfaces that require greasing or oil. Black arrows indicate grease nipples, and signify that grease should be inserted using a grease pump.



Note: Even LM blocks that do not have a nipple can be lubricated by applying grease between the block and the LM rail (bearing mechanism). The grease that adheres to the ball bearings and rollers will be taken into the LM block and thereby serve to lubricate the LM block.

Lubrication Checklist

A lubrication checklist is provided at the end of this chapter. This checklist should be used as follows.

1. Check the lubrication points corresponding to the reference numbers shown in the illustrations.
2. Mark each check box after lubricating each point.

5.2.4 Lubricating the XY-table

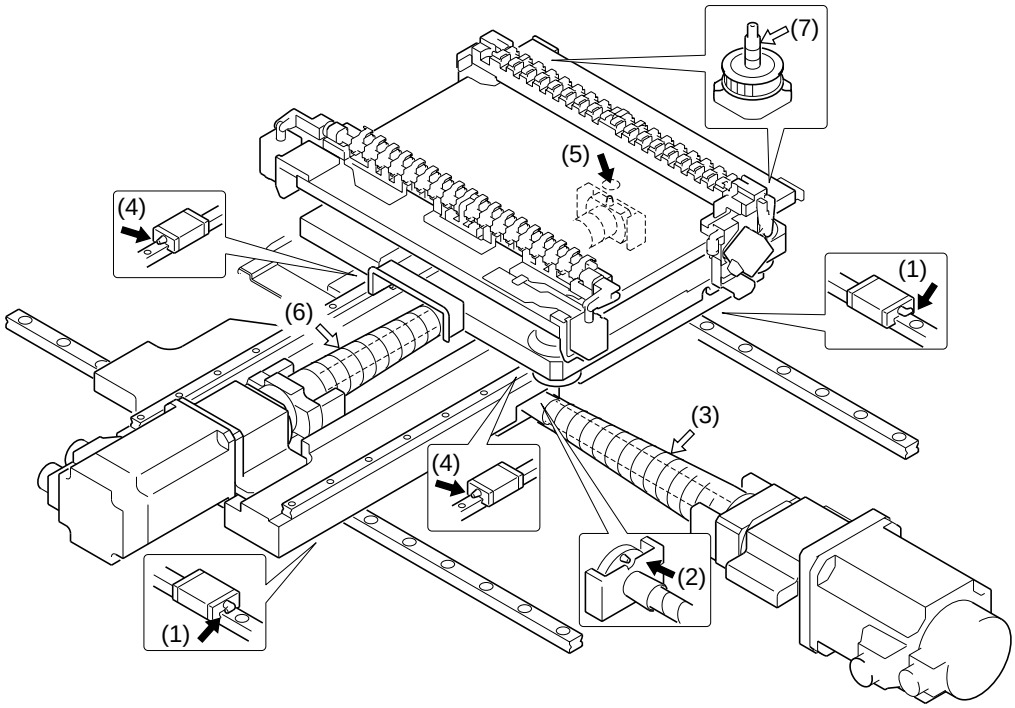
Lubrication points		Types of lubricant	Schedule
1	X-axis LM block	Daphne Exponex No. 2	Every 3 months
2	X-axis ball screw	Multemp LRL3	Monthly
3	X-axis screw cover	Daphne Super Multi Oil 32	Every 3 months
4	Y-axis LM block	Daphne Exponex No. 2	Every 3 months
5	Y-axis ball screw	Multemp LRL3	Monthly
6	Y-axis screw cover	Daphne Super Multi Oil 32	Every 3 months
7	Z-axis ball screw	Multemp SRL	Monthly

C746M3T03

Caution: If the grease on the Y-axis screw cover dries, the cover must be lubricated, even if the cover is not due for periodic lubrication. Apply a thin layer of grease using a brush. Compressing the screw cover by hand may result in injury. Furthermore, incorrect removal or installation of the screw cover may result in damage to the machine.

Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.

Caution: Always lubricate the X-axis/Y-axis ball screws using a grease pump to apply grease to the nipples. Applying grease directly to the ball screws or closing the cover by hand may result in injury. Furthermore, incorrect removal or installation of the screw cover may result in damage to the machine.



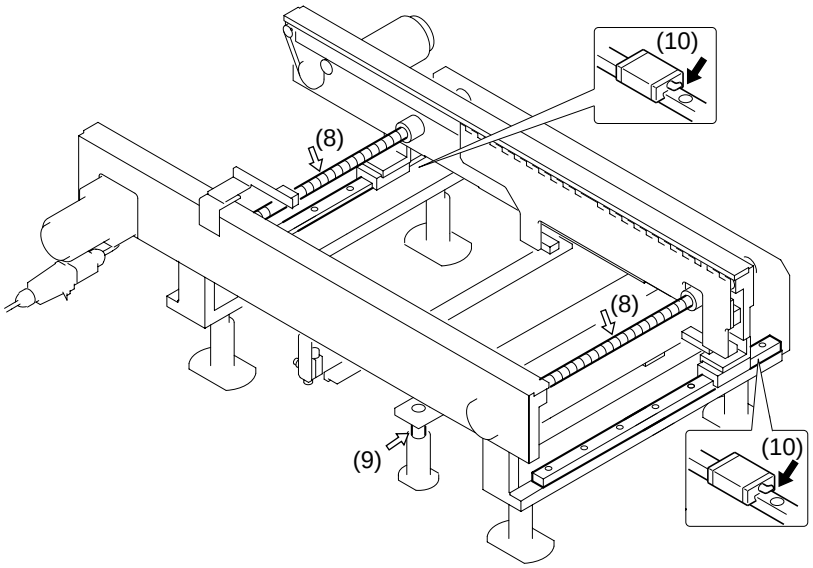
C746M3017

5.2.5 Lubricating the Conveyors

Lubrication points		Types of lubricant	Schedule
8	Ball screw	Daphne Exponex No. 2	Every 6 months
9	Lifter guide bar	Daphne Exponex No. 2	Every 6 months
10	LM block	Daphne Exponex No. 2	Every 6 months

C746M3T04

Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.



C746M3018

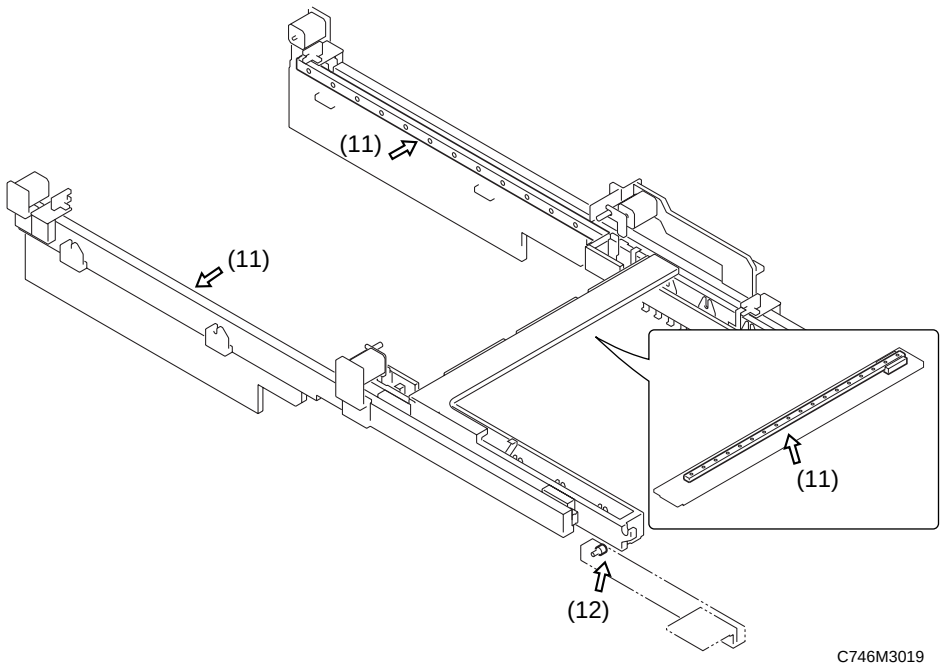
Note: The out-conveyor should also be lubricated in the same manner as the in-conveyor shown in the figure above.

5.2.6 Lubricating the Carriers

Lubrication points		Types of lubricant	Schedule
11	LM rail	Daphne Exponex No. 2	Every 3 months
12	Cam follower	Daphne Exponex No. 2	Every 3 months

C746M3T05

Arrow marks in the illustration indicate lubrication points.



C746M3019

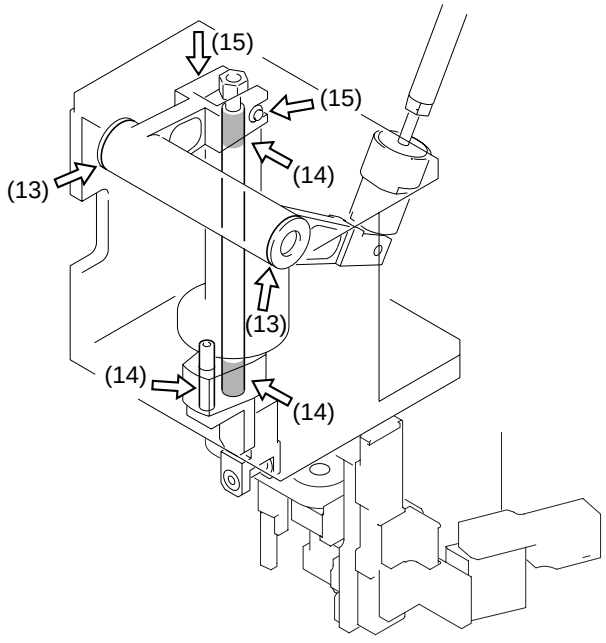
Note: The out-carrier should also be lubricated in the same manner as the in-carrier shown in the figure above.

5.2.7 Lubricating the Tape Advance Link

Lubrication points		Types of lubricant	Schedule
13	Tape feed lever	AFC grease	Monthly
14	Shaft	Daphne Exponex No. 2	Monthly
15	Joint	AFC grease	Monthly

C746M3T06

Arrow marks in the illustration indicate lubrication points.



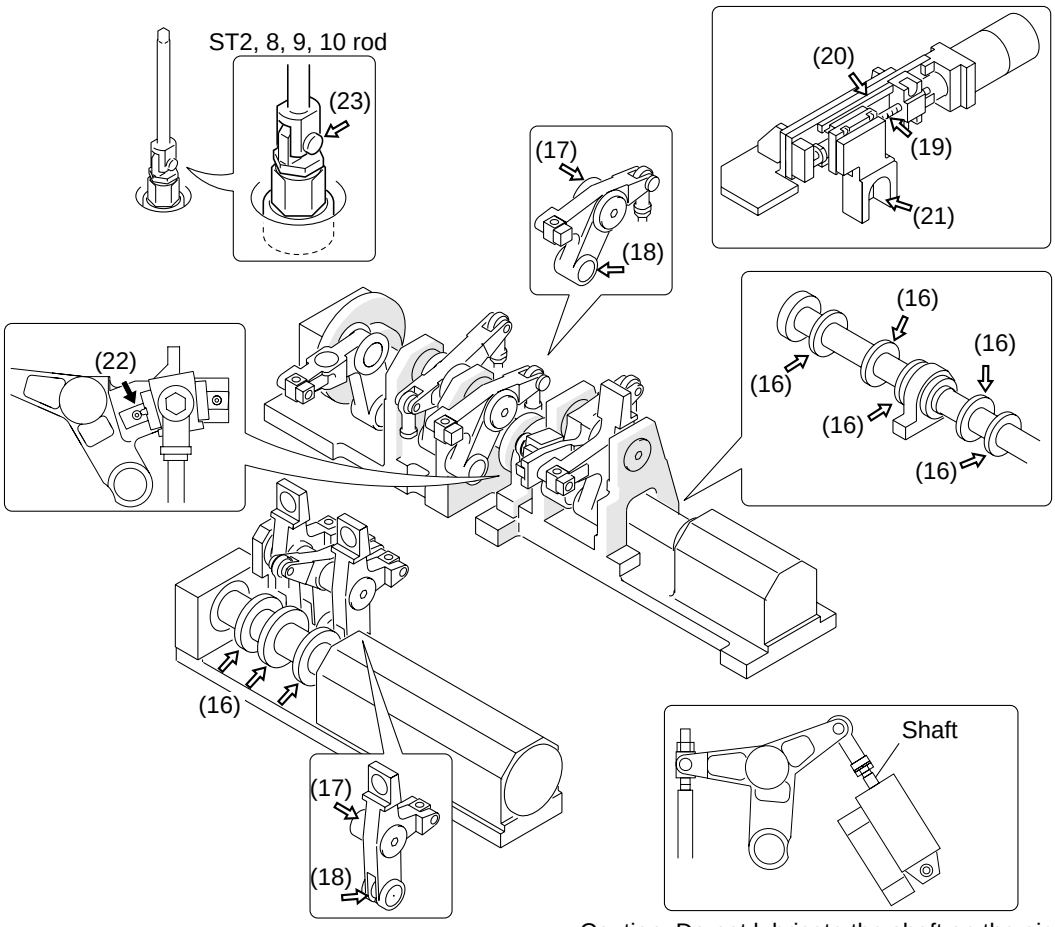
C746M3020

5.2.8 Lubricating the Cam Box

Lubrication points		Types of lubricant	Schedule
16	Cam	Daphne Exponex No. 2	Monthly
17	Cam lever pivot (7 points)	AFC grease	Monthly
18	Cam lever bearing	Daphne Exponex No. 2	Monthly
19	NZ-axis ball screw	Daphne Exponex No. 2	Monthly
20	NZ-axis LM rail	Daphne Exponex No. 2	Every 3 months
21	NZ-axis holder	Daphne Exponex No. 2	Every 3 months
22	NZ-axis LM block	AFC grease	Every 3 months
23	θ-axis connecting pin	Daphne Exponex No. 2	Monthly

C746M3T07

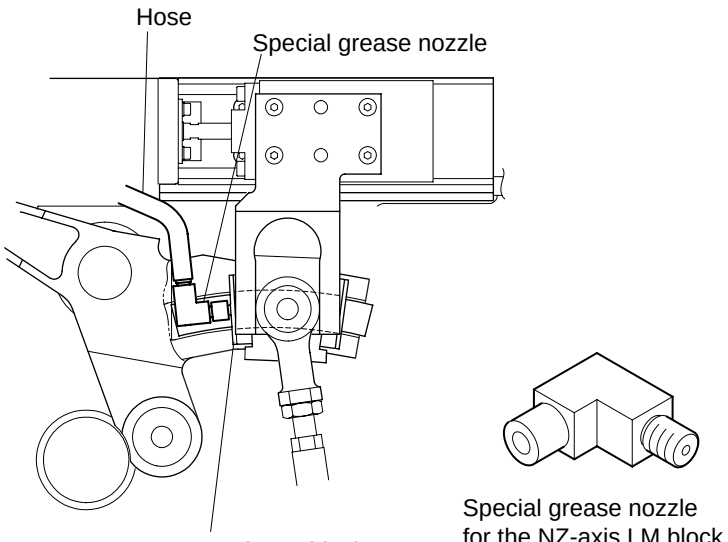
Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.



Note: Lubrication of (22) requires a special grease nozzle. Refer to the next page for details.

Caution: Do not lubricate the shaft on the air cylinder.

C746M3021



Connect the hose to the special grease nozzle and inject grease into the NZ-axis LM block.

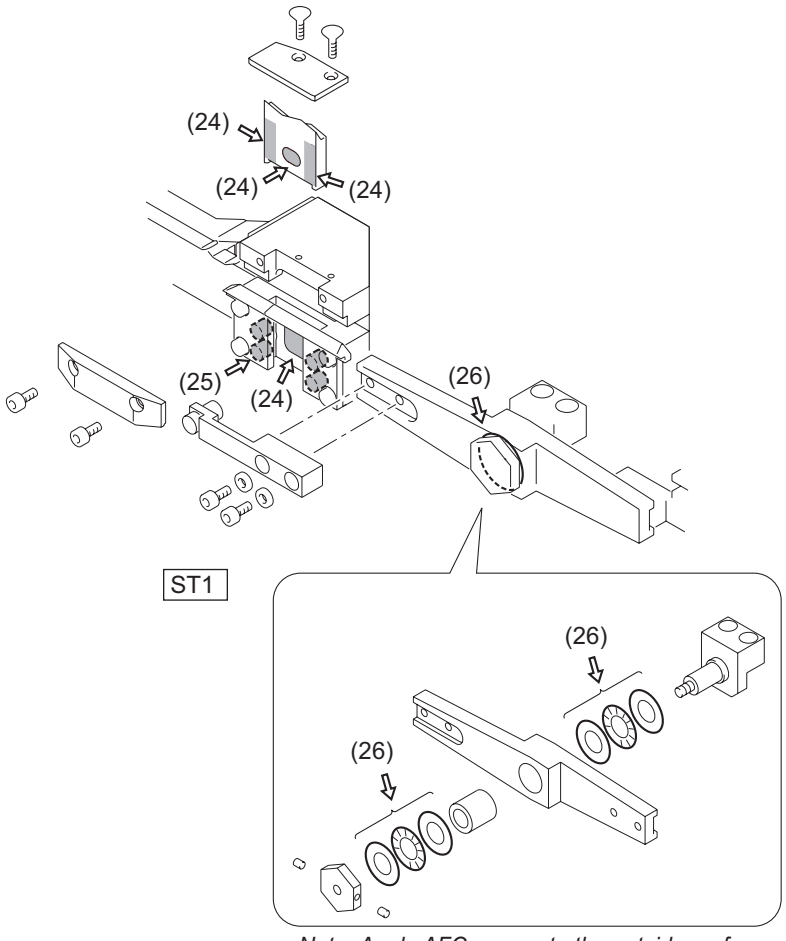
C746M3040

5.2.9 Lubricating the Waste Tape Disposal Unit

Lubrication points		Types of lubricant	Schedule
24	Movable cutter	Daphne Exponex No. 2	Weekly
25	Cam follower	Daphne Exponex No. 2	Weekly
26	Thrust bearing	AFC grease	Monthly

C746M3T08

Arrow marks in the illustration indicate lubrication points.



Note: Apply AFC grease to the outside surface of the thrust bearing.
Disassembly is not required.

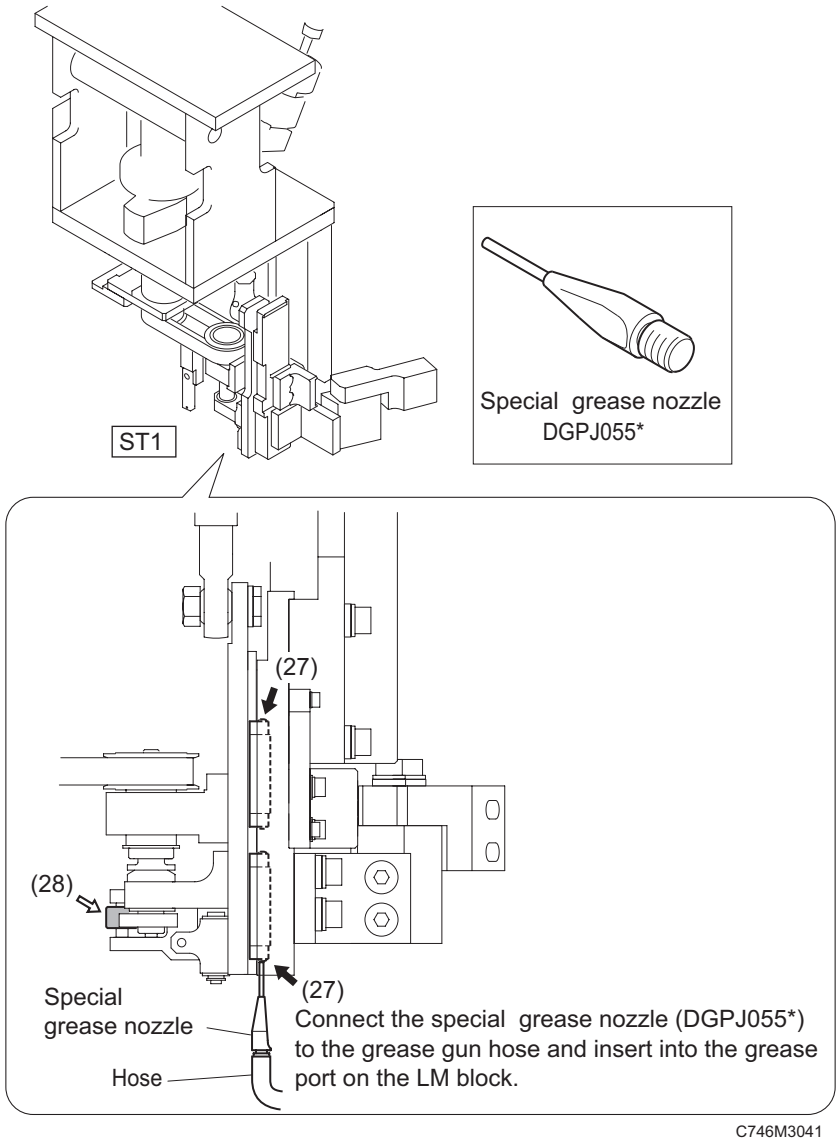
C746M3022

5.2.10 Lubricating the NY-Axis Pickup Offset Mechanism

Lubrication points		Types of lubricant	Schedule
27	LM block	AFC grease	Monthly
28	Roller	Multemp LRL3	Monthly

C746M3T21

Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.



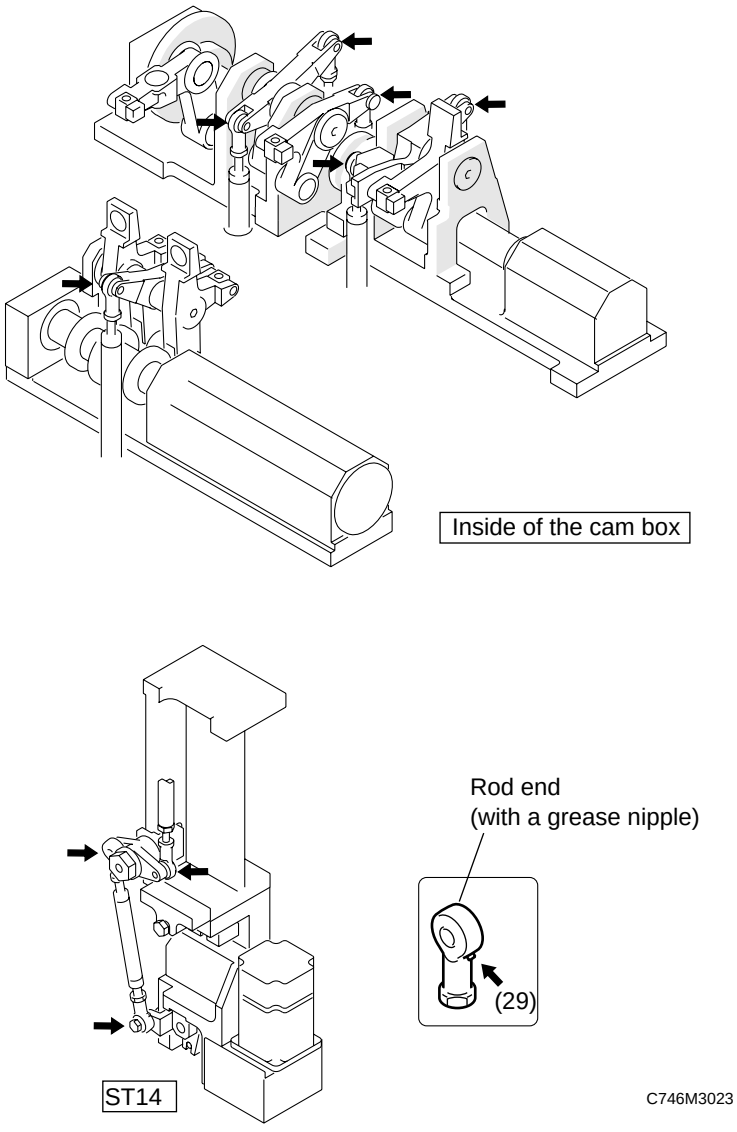
C746M3041

5.2.11 Lubricating the Rod Ends

Lubrication points		Types of lubricant	Schedule
29	Rod end	Daphne Exponex No. 2	Every 3 months

C746M3T09

Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.



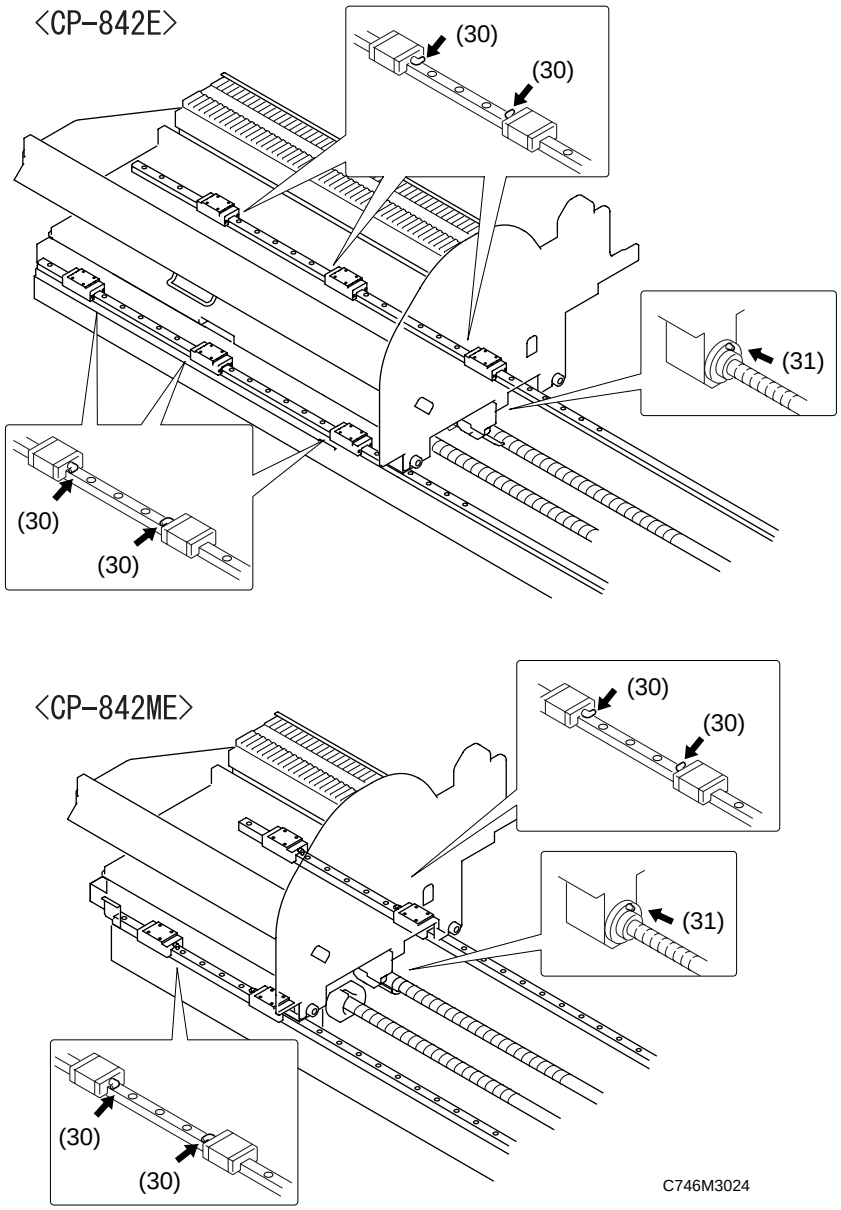
C746M3023

5.2.12 Lubricating the D-axis Carriers

Lubrication points		Types of lubricant	Schedule
30	D-axis LM block	Daphne Exponex No. 2	Every 3 months
31	D-axis ball screw	Multemp LRL3	Monthly

C746M3T10

Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.

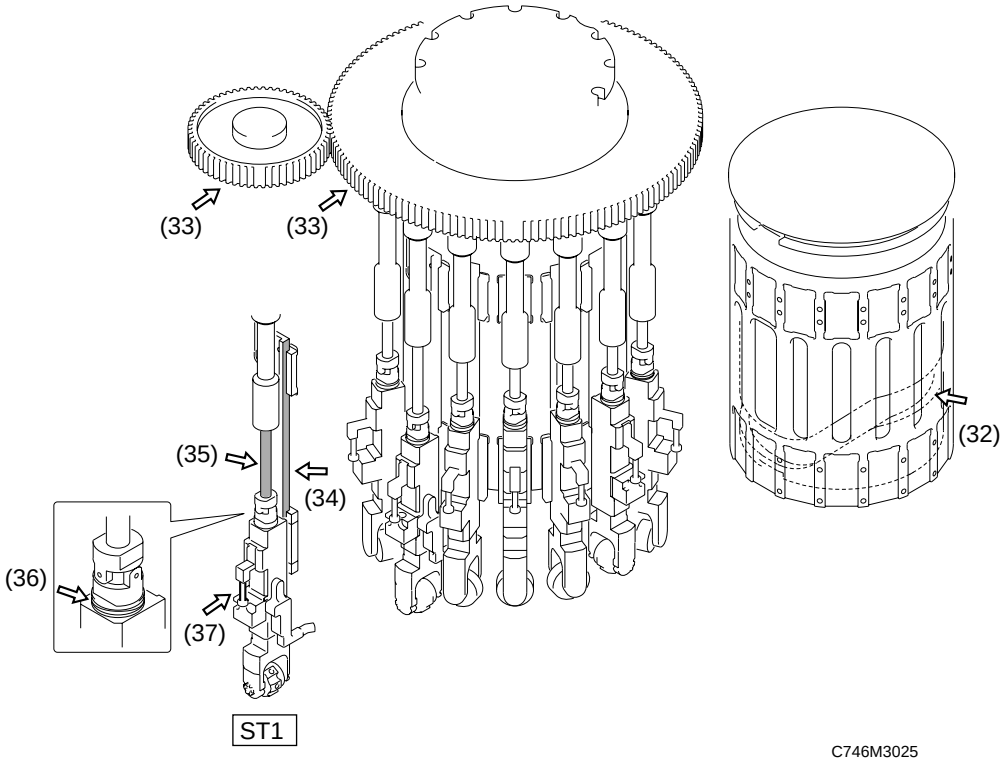


5.2.13 Lubricating the Rotary Head

Lubrication points		Types of lubricant	Schedule
32	Turret groove	Daphne Exponex No. 2	Monthly
33	Helical gear	Daphne Exponex No. 2	Monthly
34	LM rail	AFC grease	Monthly
35	Spline shaft	AFC grease	Monthly
36	Wave washer	Daphne Exponex No. 2	Every 3 months
37	Pin	AFC grease	Monthly

C746M3T11

Arrow marks in the illustration indicate lubrication points.



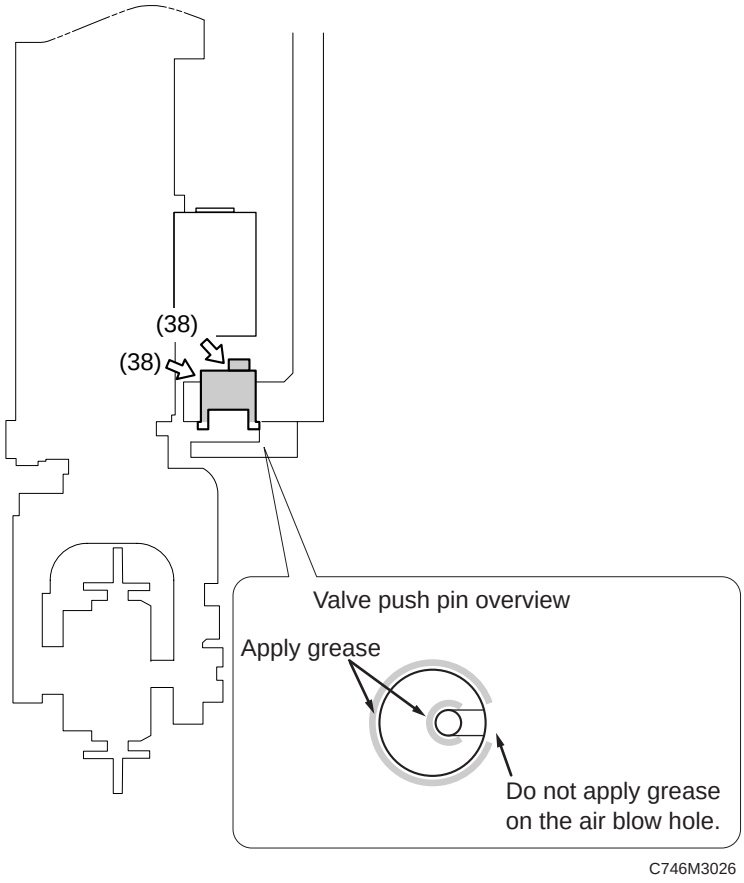
C746M3025

5.2.14 Lubricating the ST9 Air Valve Push Pin

Lubrication points		Types of lubricant	Schedule
38	Valve push pin	AFC grease	Monthly

C746M3T12

Arrow marks in the illustration indicate lubrication points.



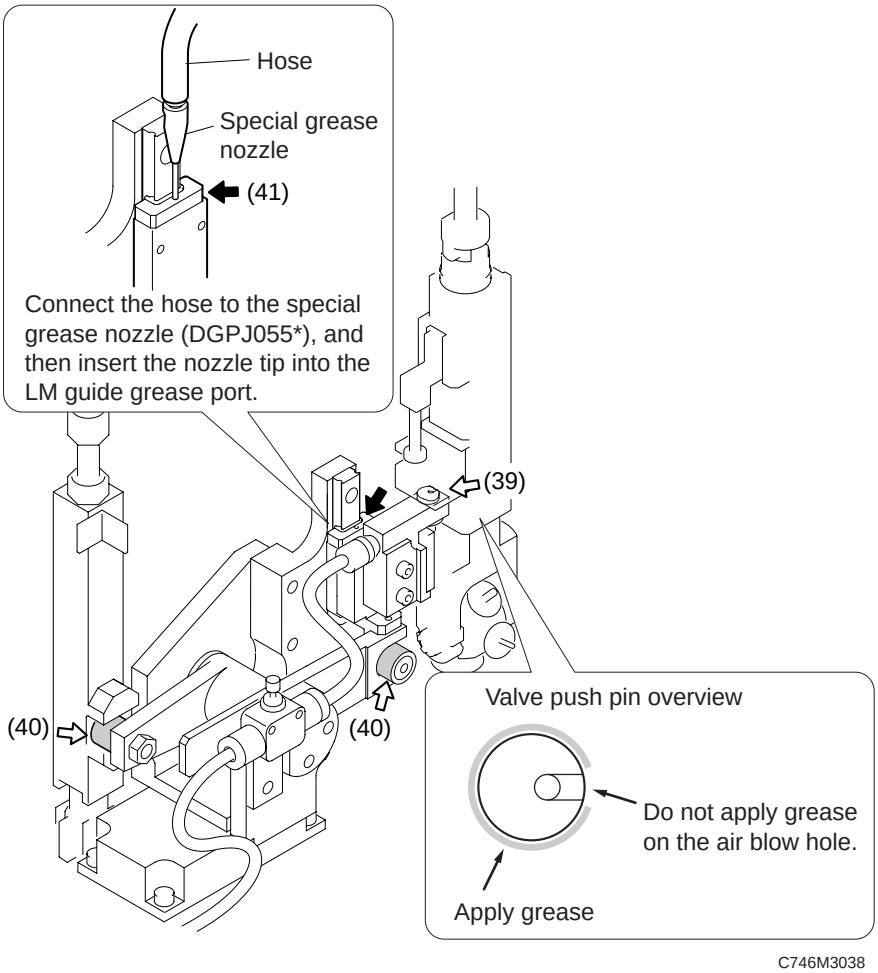
C746M3026

5.2.15 Lubricating the Parts Reject Unit

Lubrication points		Types of lubricant	Schedule
39	Valve push pin	AFC grease	Monthly
40	Cam follower	AFC grease	Every 3 months
41	LM rail	AFC grease	Every 3 months

C746M3T13

Arrow marks in the illustration indicate lubrication points. Black arrows indicate points where a grease gun is required.


Hose
Special grease nozzle
(41)
Connect the hose to the special grease nozzle (DGPJ055*), and then insert the nozzle tip into the LM guide grease port.
(39)
(40)
(40)
Valve push pin overview
Do not apply grease on the air blow hole.
Apply grease

C746M3038

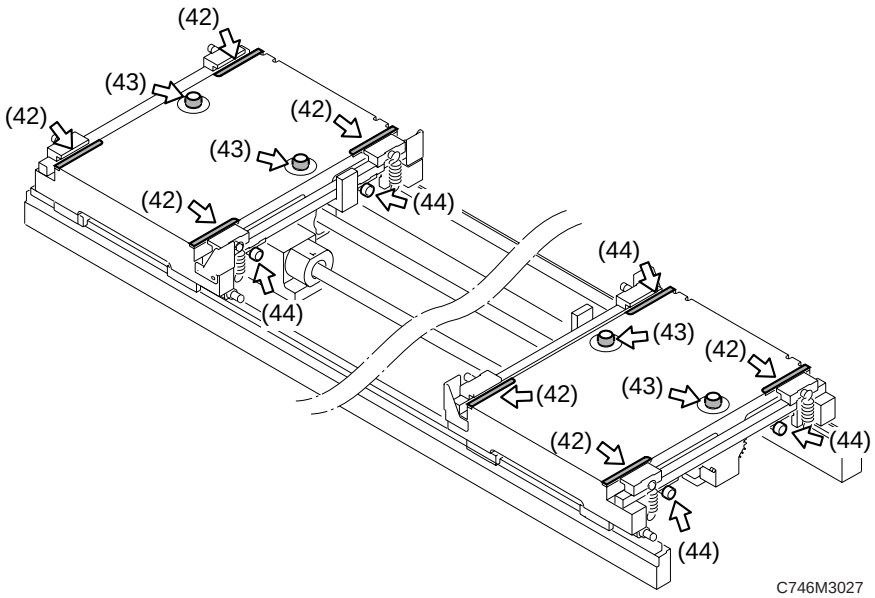
5.2.16 Lubricating the Pallet Table

Lubrication points		Types of lubricant	Schedule
42	Pallet clamp surface	AFC grease	Every 3 months
43	Clamp pin	AFC grease	Every 3 months
44	Cam follower	Daphne Eponex No.2	Monthly

C746M3T14

Arrow marks in the illustration indicate lubrication points.

<CP-842ME> Option



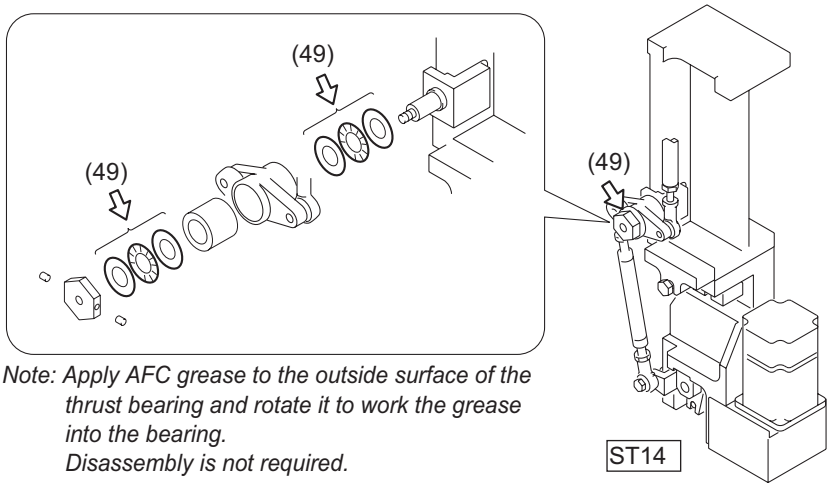
C746M3027

5.2.17 Lubricating the Nozzle Changer

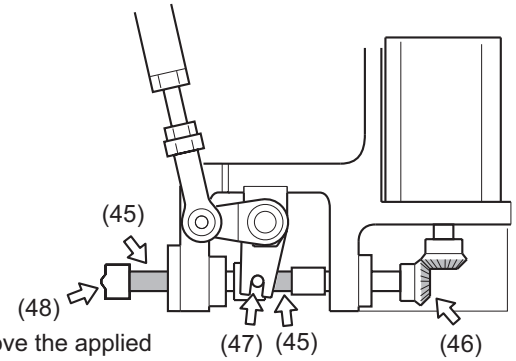
Lubrication points		Types of lubricant	Schedule
45	Spline shaft	AFC grease	Monthly
46	Beveled gear	Daphne Exponex No. 2	Monthly
47	Moveable sections on the lever	Daphne Exponex No. 2	Every 3 months
48	Clutch engagement surface	Daphne Exponex No. 2	Monthly
49	Thrust bearing	AFC grease	Monthly

C746M3T15

Arrow marks in the illustration indicate lubrication points.



Note: Apply AFC grease to the outside surface of the thrust bearing and rotate it to work the grease into the bearing.
Disassembly is not required.



Lightly remove the applied grease, leaving behind a thin film

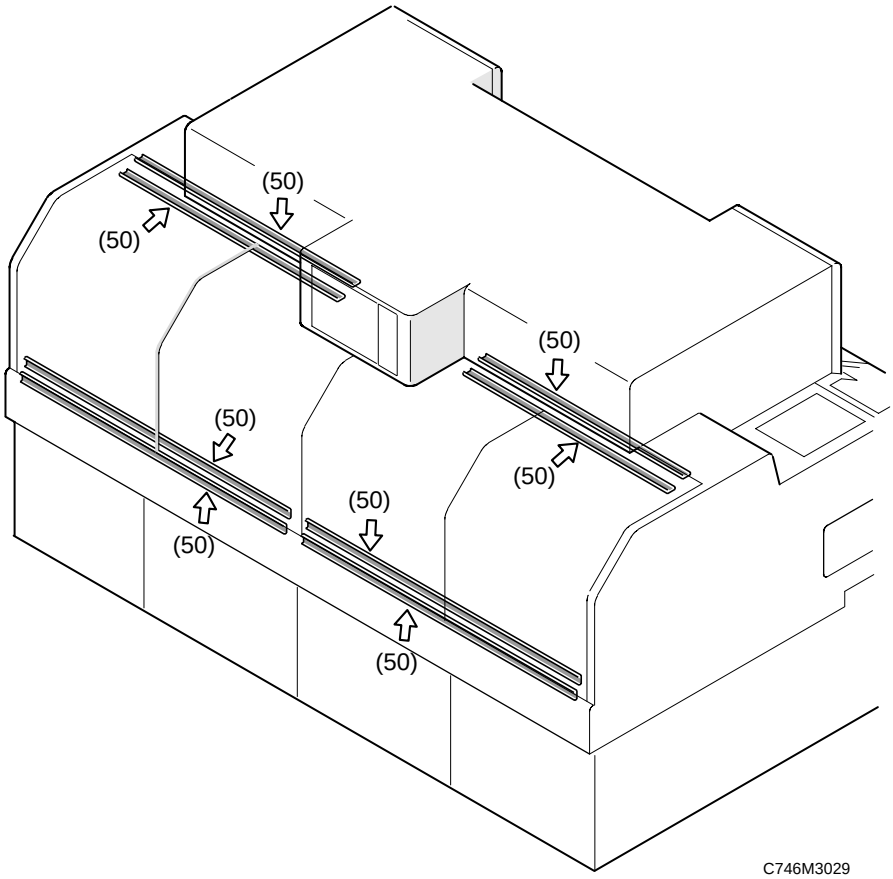
C746M3028

5.2.18 Lubricating the Rear Cover

Lubrication points		Types of lubricant	Schedule
50	Slide rail	Daphne Exponex No. 2	Every 3 months

C746M3T16

Arrow marks in the illustration indicate lubrication points.



C746M3029

Note: The above drawing represents the CP-842ME. Please conduct lubrication for the CP-842E in the same fashion.

5.2.19 Lubricating the Index Unit

Point

The lubricant for the index unit in the cam box is contained within the oil cooler on the left side of the box. Replace the oil in the oil cooler once every three years or after 12,000 hours of operation.

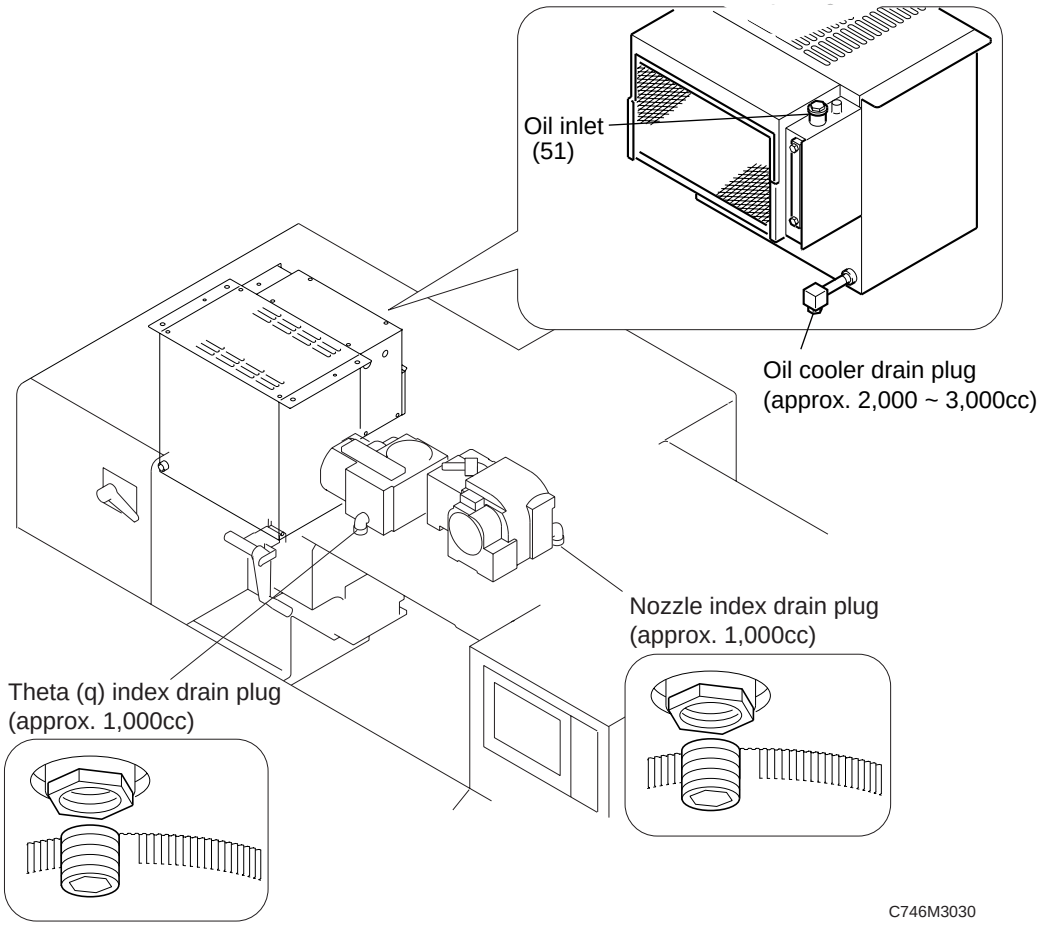
Lubrication points		Types of lubricant	Schedule
51	Oil cooler	SHC 630	Every 3 years or 12,000 hours

C746M3T17

Procedure

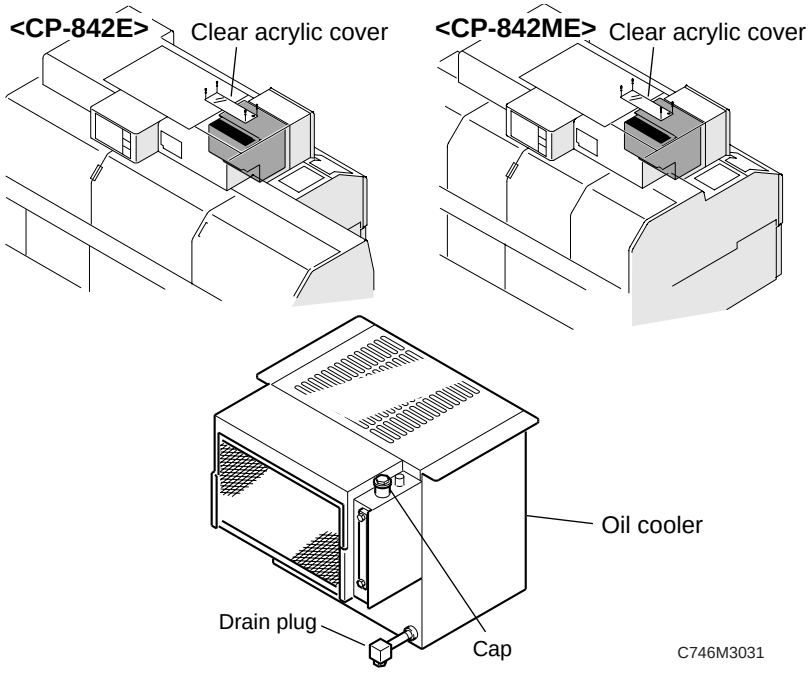
The oil in the oil cooler can be drained at three locations. Refer to the diagram below for guidelines on how much oil should be removed from each drain plug.

Prepare in advance a bucket for collecting the old oil, a plastic sheet with which to cover the machine, and some corrugated cardboard.



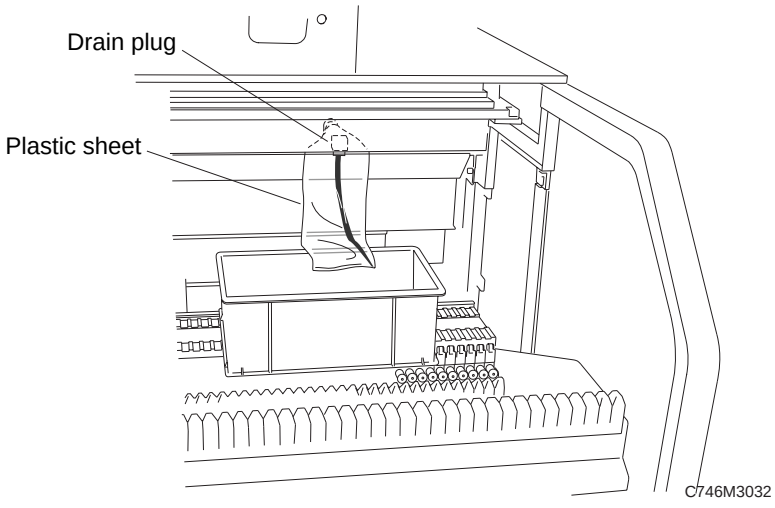
C746M3030

1 Remove the acrylic cover from the top of the machine, and remove the cap from the oil cooler.



2 Open the cover on the rear left of the machine.

3 Remove the old cooler oil using the drain plugs. Protect the area surrounding the drain plugs using a plastic sheet, remove the drain plug and drain the oil into a collecting bucket.



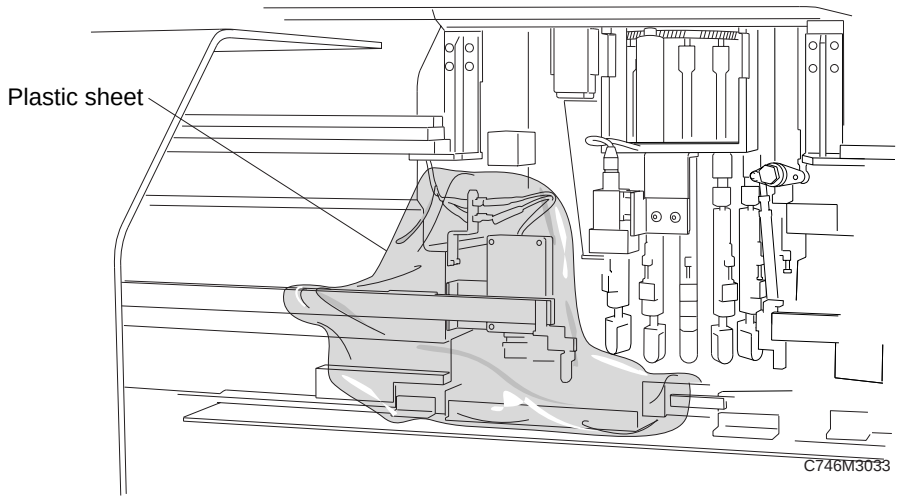
Note:1. Cover the machine carefully to prevent oil spilling on the machine when draining the oil cooler.

2. The oil removed from the machine should be discarded in accordance with local ordinances for handling waste matter.

4 Replace and properly tighten the drain plugs once the oil has been fully removed.

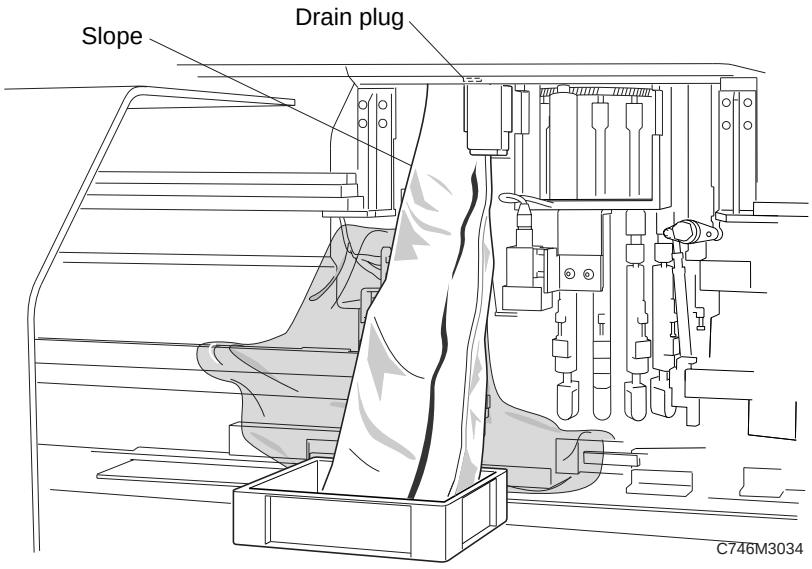
5 Open the doors at the rear of the machine.

6 Cover the cameras, prism box and surrounding areas with a plastic sheet.



Note: Cover the machine carefully to prevent oil spilling on the machine when draining the oil cooler.

7 Remove the oil from the nozzle index unit drain plug.
Cover the corrugated cardboard with a plastic sheet, create a slope and drain the contents of the nozzle index unit into a collecting bucket.7.Remove the oil from the nozzle index unit drain plug.

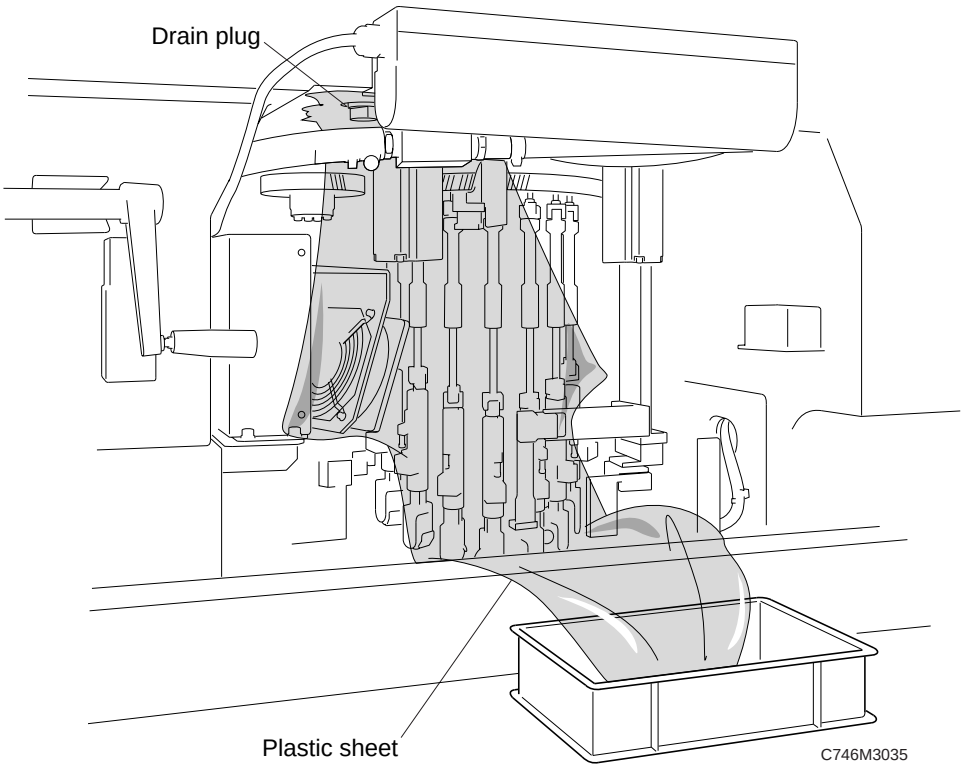


Note: The oil removed from the machine should be discarded in accordance with local ordinances from handling waste matter.

8 Replace and properly tighten the drain plug once the oil has been fully removed.

9 Open the front doors.

10 Remove the oil from the theta (q) index unit drain plug.
Use a plastic sheet as shown in the diagram below, remove the drain plug and drain the old oil into the collecting bucket.10.Remove the oil from the theta (q) index unit drain plug.



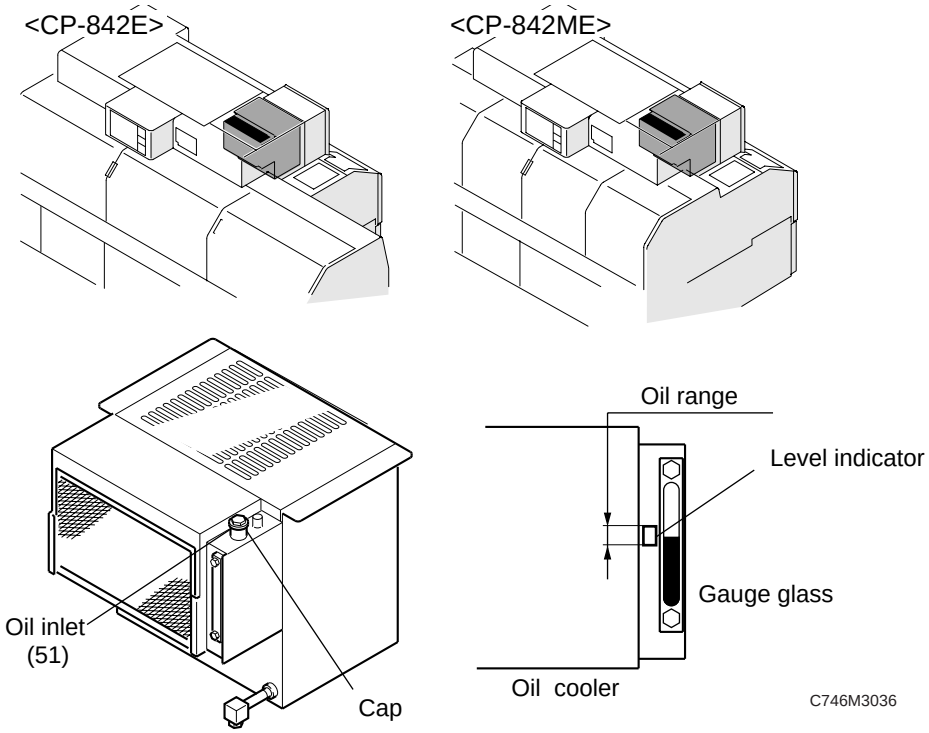
Note:

1. Carefully arrange the plastic sheet to prevent oil spilling on the machine when draining the oil cooler.

2. The oil removed from the machine should be discarded in accordance with local ordinances from handling waste matter.

11 Replace and properly tighten the drain plug once the oil has been fully removed.

12 Slowly pour the new lubricating oil into the inlet on the top of the oil cooler.



13 Ensure that the surface of the oil is in the range specified by the level indicator.

Note: Whether the machine is at rest or during operation, the oil level does not normally change. Immediately after replacing the oil after 3 years or 12,000 hours of operation, the oil level will drop when operating the machine. Following operation, add more oil until the level falls within the recommended range.

5.2.20 Lubricating the Cam Lever Air Cylinder

Lubrication points		Types of lubricant	Schedule
52	Air cylinder	Turbine oil + NASKALUBE (*)	Every 6 months

(*) The lubrication used is a Fuji special blend (Turbine oil + NASKALUBE). Contact Fuji when placing an order.

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Procedure

1 Open the lid of the lubricator with a Phillips driver.

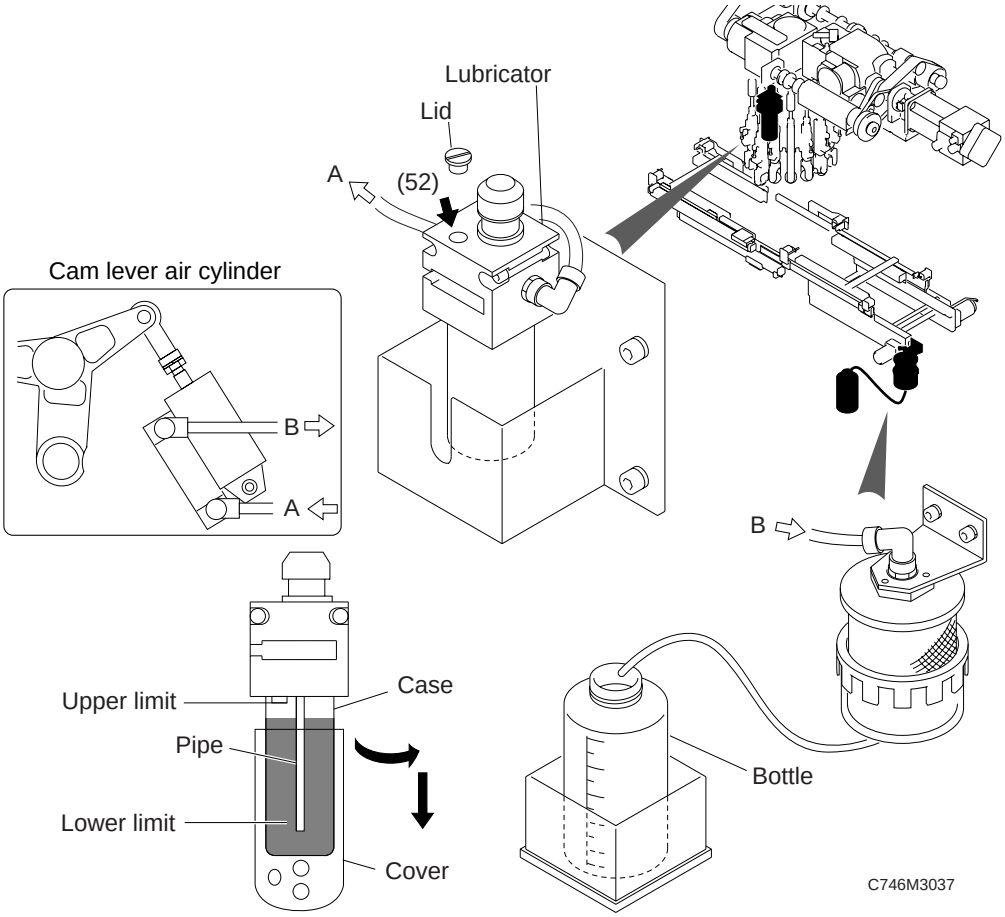
2 Lower the lubricator cover.

3 Visually check the oil level of the oil tank and slowly pour in the oil to the lubricator. Be sure not to exceed the upper limit while pouring in the oil.

Note: The maximum amount of oil that can be supplied to the lubricator is 75 cc. If the oil level does not reach the tip of the pipe inside the case, there will be insufficient oil to lubricate the cylinder.

4 Replace the lubricator cover and attach the oil inlet cap.

5 Check and discard of any accumulated waste oil in the collection bottle.



5.2.21 Lubrication Checklist

(1/2)

Lubrication points			Types of lubricant	Schedule	Check
1	XY-table	X-axis LM block	Daphne Exponex No. 2	Every 3 months	
2		X-axis ball screw	Multemp LRL3	Monthly	
3		X-axis screw cover	Daphne Super Multi Oil 32	Every 3 months	
4		Y-axis LM block	Daphne Exponex No. 2	Every 3 months	
5		Y-axis ball screw	Multemp LRL3	Monthly	
6		Y-axis screw cover	Daphne Exponex No. 2	Every 3 months	
7		Z-axis ball screw	Multemp SRL	Monthly	
8	Conveyors	Ball screw	Daphne Exponex No. 2	Every 6 months	
9		Lifter guide bar	Daphne Exponex No. 2	Every 6 months	
10		LM block	Daphne Exponex No. 2	Every 6 months	
11	Carriers	LM rail	Daphne Exponex No. 2	Every 3 months	
12		Cam follower	Daphne Exponex No. 2	Every 3 months	
13	Tape advance link	Tape feed lever	AFC grease	Monthly	
14		Shaft	Daphne Exponex No. 2	Monthly	
15		Joint	AFC grease	Monthly	
16	Cam box	Cam	Daphne Exponex No. 2	Monthly	
17		Cam lever pivot (7 points)	AFC grease	Monthly	
18		Cam lever bearing	Daphne Exponex No. 2	Monthly	
19		NZ-axis ball screw	Daphne Exponex No. 2	Monthly	
20		NZ-axis LM rail	Daphne Exponex No. 2	Every 3 months	
21		NZ-axis holder	Daphne Exponex No. 2	Every 3 months	
22		NZ-axis LM block	AFC grease	Every 3 months	
23		θ-axis connecting pin	Daphne Exponex No. 2	Monthly	
24	Waste tape disposal	Movable cutte	Daphne Exponex No. 2	Weekly	
25		Cam follower	Daphne Exponex No. 2	Weekly	
26		Thrust bearing	AFC grease	Monthly	
27	NY-axis pickup offset	LM block	AFC grease	Monthly	
28		Roller	Multemp LRL3	Monthly	

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(2/2)

Lubrication points			Types of lubricant	Schedule	Check
29	Rod ends	Rod end	Daphne Exponex No. 2	Every 3 months	
30	D-axis carriers	D-axis LM block	Daphne Exponex No. 2	Every 3 months	
31		D-axis ball screw	Multemp LRL3	Monthly	
32	Rotary head	Turret groove	Daphne Exponex No. 2	Monthly	
33		Helical gear	Daphne Exponex No. 2	Monthly	
34		LM rail	AFC grease	Monthly	
35		Spline shaft	AFC grease	Monthly	
36		Wave washer	Daphne Exponex No. 2	Every 3 months	
37		Pin	AFC grease	Monthly	
38	ST9 Air valve push pin	Valve push pin	AFC grease	Monthly	
39	Parts reject unit	Valve push pin	AFC grease	Monthly	
40		Cam follower	AFC grease	Every 3 months	
41		LM rail	AFC grease	Every 3 months	
42	Pallet table	Pallet clamp surface	AFC grease	Every 3 months	
43		Clamp pin	AFC grease	Every 3 months	
44		Cam follower	Daphne Exponex No. 2	Every 3 months	
45	Nozzle changer	Spline shaft	AFC grease	Monthly	
46		Beveled gear	Daphne Exponex No. 2	Monthly	
47		Moveable sections on the lever	Daphne Exponex No. 2	Every 3 months	
48		Clutch engagement surface	Daphne Exponex No. 2	Monthly	
49		Thrust bearing	AFC grease	Monthly	
50	Rear cove	Slide rail	Daphne Exponex No. 2	Every 3 months	
51	Index unit	Oil cooler	SHC630	Every 3 yrs or 12,000 hrs	
52	Cam lever	Air cylinder	Turbine oil + NASKALUBE*	Every 6 months	

*: Fuji special blend

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6. Replacing Consumable Parts

6.1 Nozzles

Point

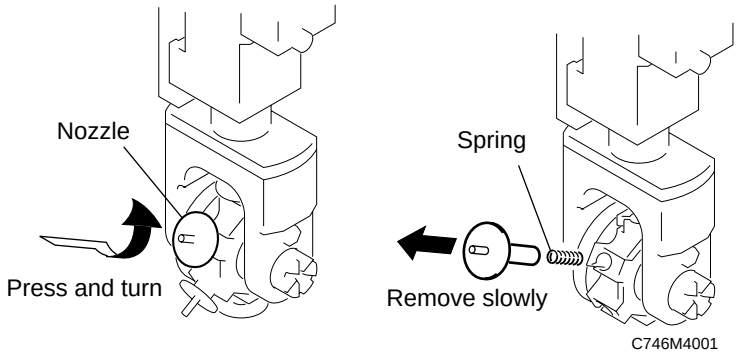
A nozzle which becomes bent, deformed, or clogged, can cause part pick-up errors and must be replaced. When replacing a nozzle, use care to avoid losing its internal spring.

Procedure

⚠ ***WARNING***

Be sure to turn the main power off before performing this procedure.

1 Remove the nozzle and spring as shown in the figure below.



Caution

1. When removing the nozzle, take care not to lose the internal spring. Also check that the spring is not left within the nozzle holder.

2. To avoid nozzle bend, do not hold the nozzle at the tip during removal.

2 Reverse the removal procedure to attach a new nozzle.

6.2 Fluorescent Nozzle Stickers

Point

Fluorescent nozzle stickers which become soiled and cause vision processing errors must be replaced.

Procedure

1 Wash hands before replacing the sticker.

2 Use a cutter to peel (from outer edge) the old sticker off the nozzle disk.

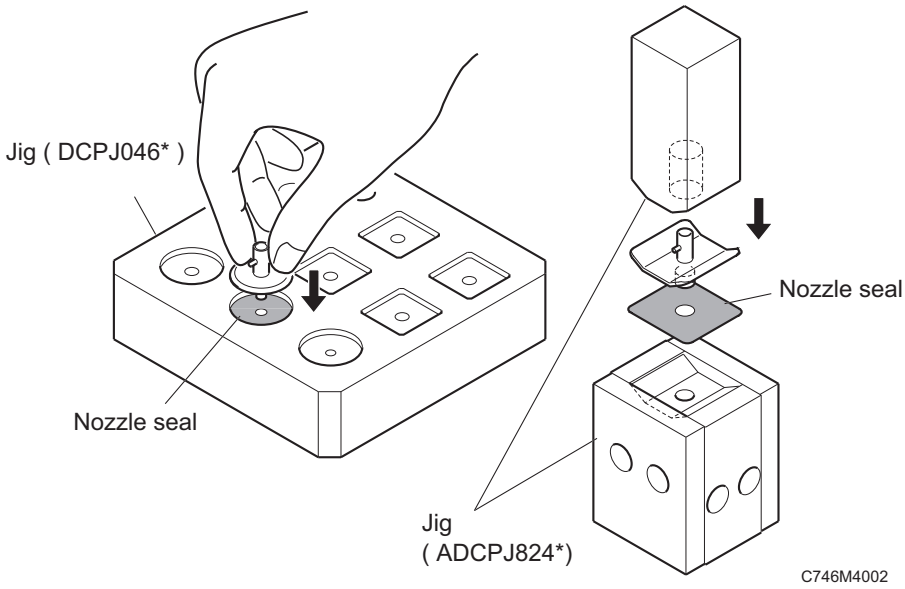
3 Use a cloth to wipe any residual adhesive off the disk.

4 Verify that the new sticker is not soiled or damaged.

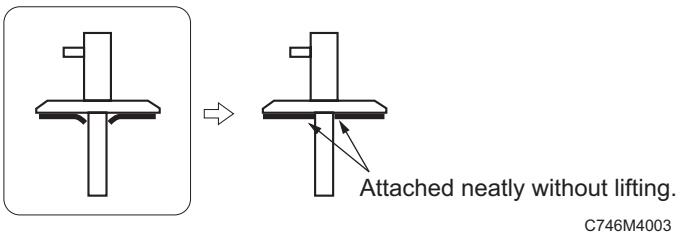
5 Peel the backing off the new sticker, and punch the nozzle tip through from the fluorescent side.

Note: Punching the nozzle tip through from the adhesive side will destroy the fluorescent coating around the hole.

6 Align the nozzle and sticker centers, and push the sticker into place using the jig. Be sure that there is no gap between the nozzle disk and the sticker.



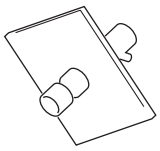
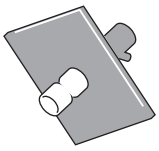
Note: Make sure that the sticker is attached firmly to the nozzle.



7 Use a cutter to trim off any of the sticker which protrudes beyond the disk.

8 Remove any of the adhesive which may have adhered to the nozzle tube.

Nozzle and fluorescent sticker drawing numbers

	Nozzle shape	Nozzle Size	Nozzle Assy Dwg. No.	Disk Size	Fluorescent Seal Dwg. No.
	Round	ϕ 0.4 (R08-004)	ADCPH751*	ϕ 8	DCPH851*
		ϕ 0.4 (R08-004) Short	ADCPH769*	ϕ 8	DCPH851*
		ϕ 0.7 (R08-007)	ADCPH752*	ϕ 8	DCPH852*
		ϕ 1.0 (R08-010)	ADCPH753*	ϕ 8	DCPH853*
		ϕ 1.3 (R08-013)	ADCPH754*	ϕ 8	DCPH854*
		ϕ 1.8 (R16-018)	ADCPH955*	ϕ 16	DCPH855*
		ϕ 2.5 (R16-025)	ADCPH956*	ϕ 16	WPH820*
		ϕ 3.7 (R16-037)	ADCPH957*	ϕ 16	WPH821*
		ϕ 5.0 (R16-050)	ADCPH958*	ϕ 16	DCPH856*
	Melf	ϕ 1.3 (M08-013)	ADCPH770*	ϕ 8	DCPH854*
		ϕ 2.5 (M16-025)	ADCPH971*	ϕ 16	WPH820*
	Round	ϕ 1.8 (S16-018)	ADCPH959*	16x16	DCPH857*
		ϕ 2.5 (S16-025)	ADCPH961*	16x16	DCPH858*
		ϕ 3.7 (S16-037)	ADCPH963*	16x16	DCPH859*
		ϕ 5.0 (S16-050)	ADCPH965*	16x16	DCPH860*
	Round	ϕ 1.8 (B16-018)	ADCPH960*	16x16	DCPH881*
		ϕ 2.5 (B16-025)	ADCPH962*	16x16	DCPH882*
		ϕ 3.7 (B16-037)	ADCPH964*	16x16	DCPH883*
		ϕ 5.0 (B16-050)	ADCPH966*	16x16	DCPH884*
		ϕ 5.0 (B21-050)	ADCPH968*	21x21	DCPH885*

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6.3 Waste Tape Cutter

Point

A broken or damaged waste tape cutter will be unable to cut the waste tape properly, causing tape clogging and tape feed problems. The waste tape cutter must be replaced at such times.

Procedure

⚠ *WARNING*

- ***Turn the main power off before performing this procedure.***
- ***Rotation may occur (caused by spring action) if the cam axis is not at its origin position (0-degrees).***
  Use special care when working inside the machine as this is a dangerous area.

1 Remove the plate located above the waste tape cutter.

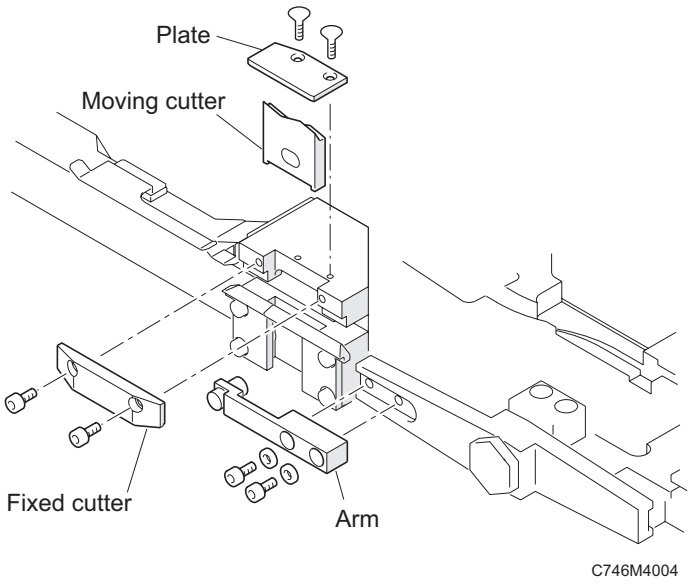
2 Remove the two bolts which secure the fixed cutter.

3 Remove the two bolts which secure the arm of the moving cutter.

4 Remove the fixed and moving cutters, and mount the new fixed and moving cutters.

Note: Apply grease to the contact points before attaching the moving cutter.

(See 5.2.9 Lubricating the Waste tape disposal unit)



6.4 Conveyor Belts

Point

Broken or damaged conveyor belts must be replaced.

Procedure

⚠ *WARNING*

Be sure to turn the main power off before performing this procedure.

1 Remove the panel lifter.

2 Loosen the bolt which secures the tension pulley and weaken the tension.

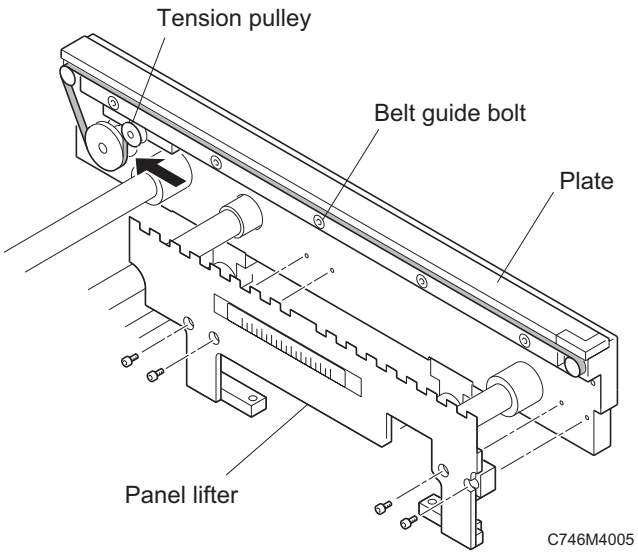
3 Loosen the belt guide bolts.

4 Replace the conveyor belt.

5 Insert a 0.3 mm clearance gauge between the belt's top surface and the plate, then tighten the belt guide bolts while maintaining this 0.3 mm clearance.

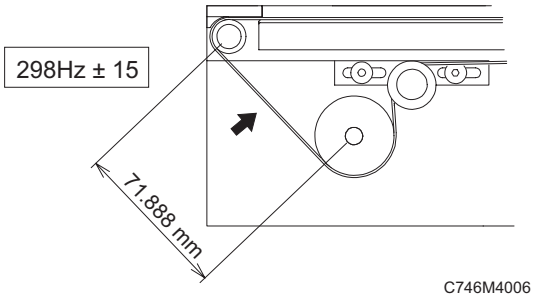
6 Tighten the belt by applying 1 to 1.5 kg of force to the tension pulley in the direction indicated by the arrow, then tighten the tension pulley bolt.

Note: The belt can also be tightened to the prescribed tension by tightening the tension pulley bolt while pushing the tension pulley 1 to 2 mm in the direction indicated by the arrow.



The standard conveyor belt tension values are as stated in the diagram below.

Check the tension using a tension meter at the points indicated by the arrows as shown.



6.5 Vacuum Pump Filter Element

Point

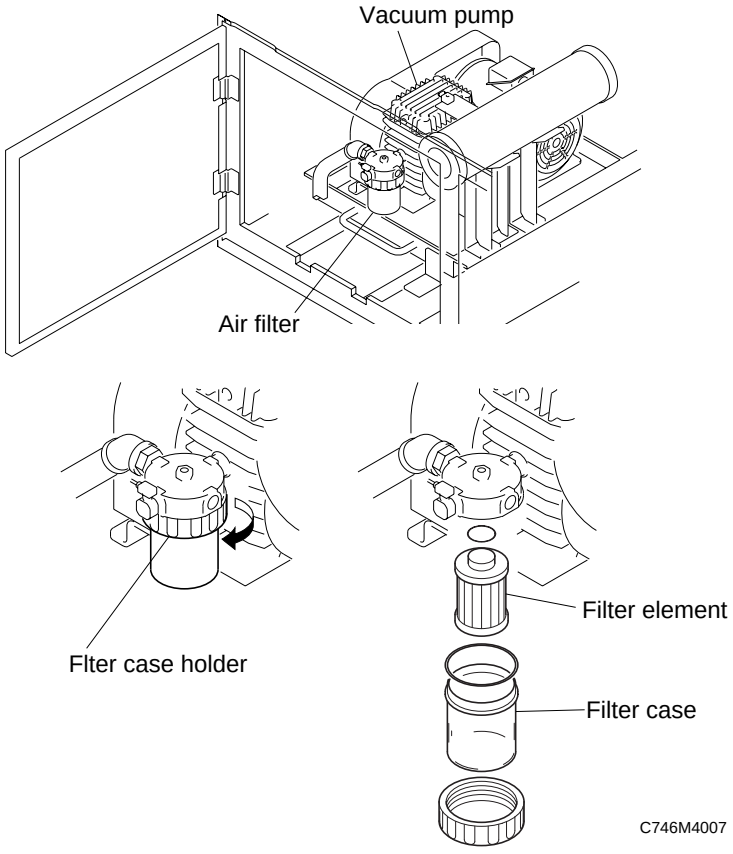
Air which is sucked into the pump must be clean. The filter element should therefore be replaced when it becomes excessively soiled.

Procedure

⚠ *WARNING*

- ***Be sure to switch off the 200V power supply before beginning this procedure.***
- ***Do not touch the vacuum pump immediately after operation as it may be extremely not. Allow the pump to cool before performing this procedure.***

Loosen the filter case holder, then extract the filter case by pulling it downward. After extracting the filter case, replace the filter element.



6.6 Vacuum Pump Belt

Point

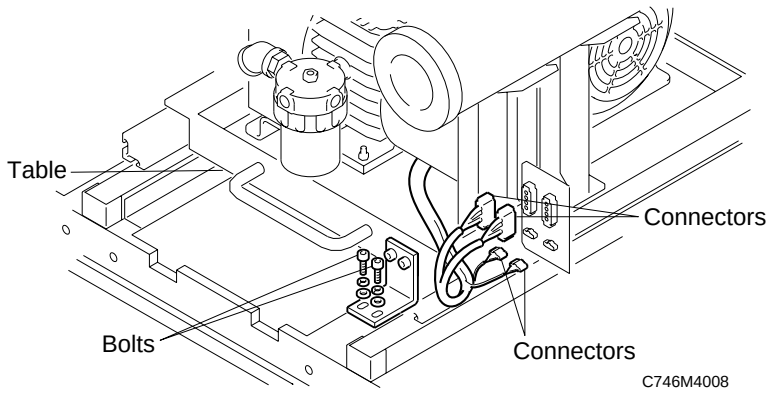
The vacuum pump belt should be replaced when broken or damaged.

Procedure

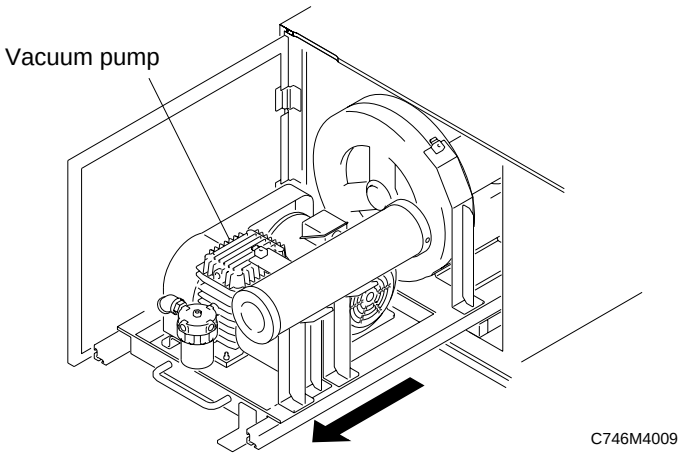
⚠ *WARNING*

- ***Be sure to switch off the 200V power supply before beginning this procedure.***
- ***Do not touch the vacuum pump immediately after operation as it may be extremely not. Allow the pump to cool before performing this procedure.***

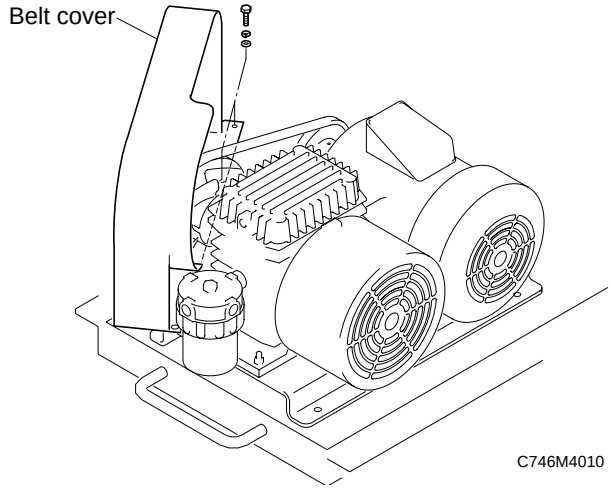
1 Remove the bracket bolts which secure the vacuum pump table, then disconnect the harness connectors.



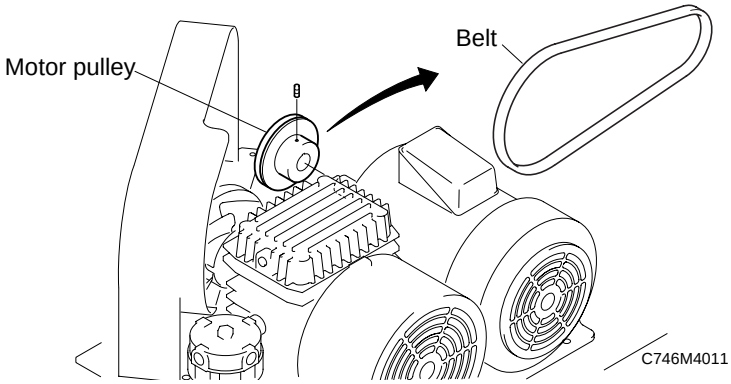
2 Pull out the vacuum pump together with the table.



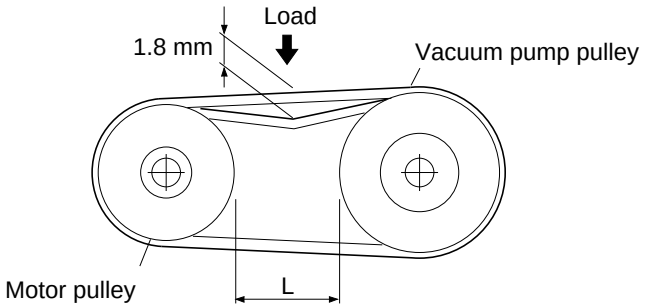
3 Open the belt cover.



4 Remove the motor pulley and replace the belt.



5 Adjust the tension of the new belt. If the belt tension is outside the prescribed range, move the motor position in 0.1 mm increments to adjust the "L" dimension.



	New Belt	Belt During Use
Amount of slack	1.8 mm	1.8 mm
Load	0.50 ~ 0.60 kg	0.38 ~ 0.46 kg
Tension meter *	28 ~ 34 lb	20 ~ 26 lb

* : Polyflex tension meter manufactured by Gates Co. C746M4012

6.7 Vacuum Pump Internal Vanes and Bearings

Point

The vacuum pump blade consists of 6 vanes. Broken vanes can cause abnormal vacuum pump noise, and may reduce the vacuum force. When replacing the vanes, the bearings must also be replaced.

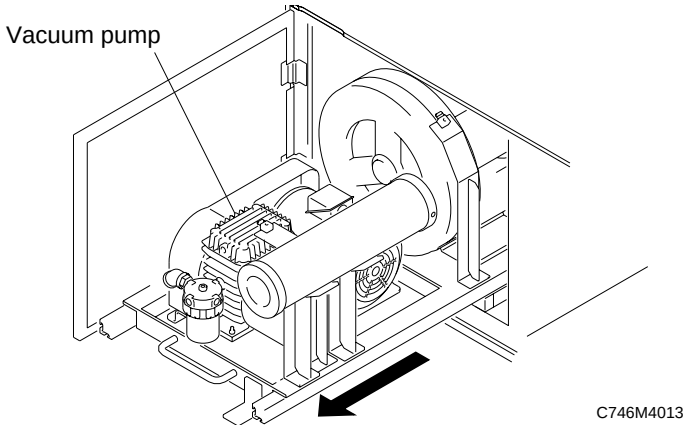
Procedure

⚠ ***WARNING***

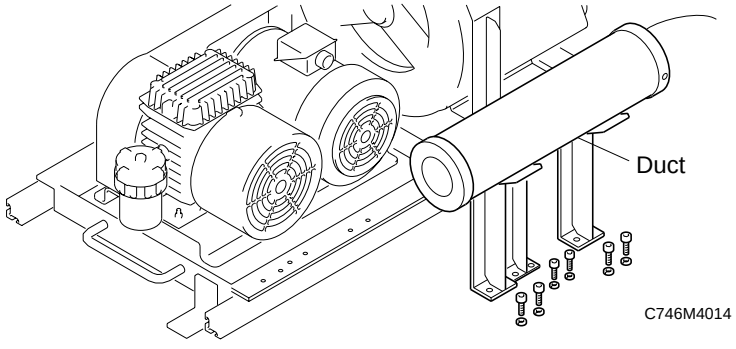
- ***Be sure to switch off the 200V power supply before beginning this procedure.***
- ***Do not touch the vacuum pump immediately after operation as it may be extremely not. Allow the pump to cool before performing this procedure.***

Disassembly

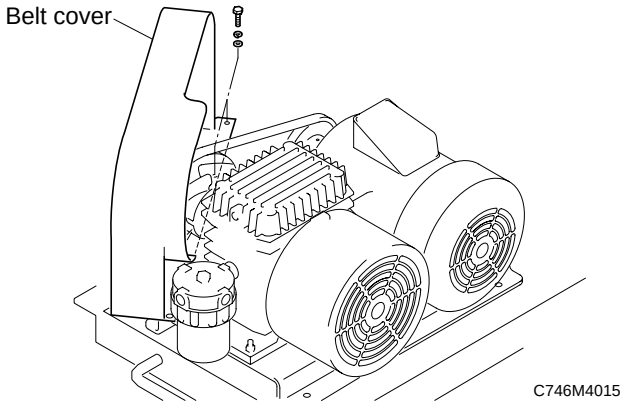
1 Pull out the vacuum pump. (For this procedure, refer to section 6.6"Vacuum Pump Belt").



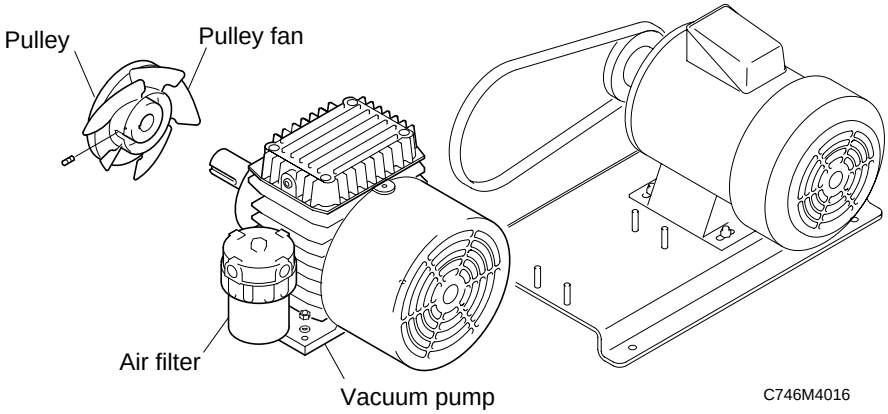
2 Remove the duct together with the bracket.



3 Open the belt cover.



4 Remove the pulley and the pulley fan, then remove the vacuum pump from the table.

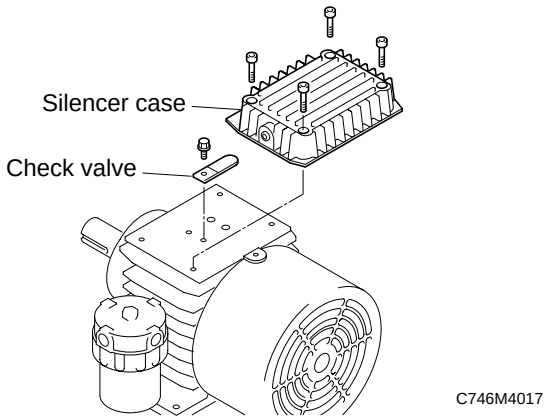


Caution: The air filter should not be removed from the vacuum pump for the folllowing reasons.

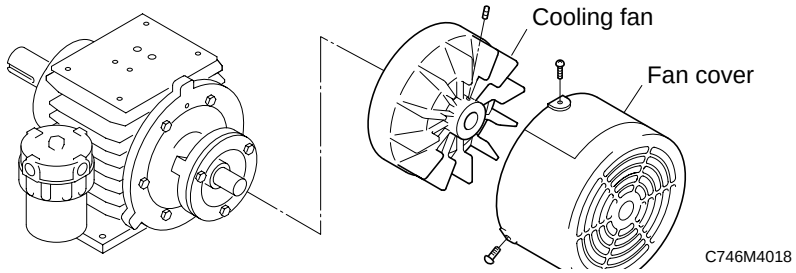
1. There is a possibility of damage to the pump plumbing or air filter bousing.

2. Metal fragments or other dust from the plumbing may get into the pump.

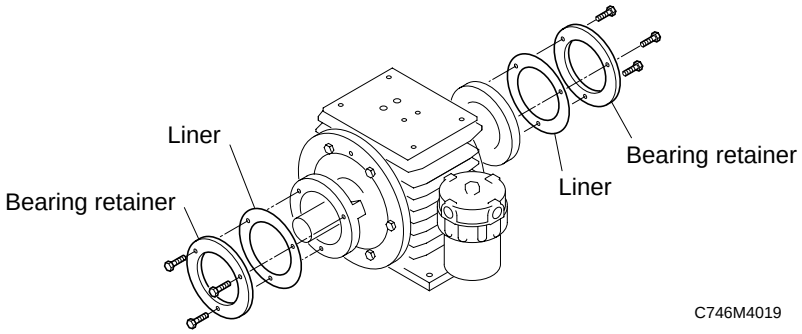
5 Remove the silencer case and the check valve.



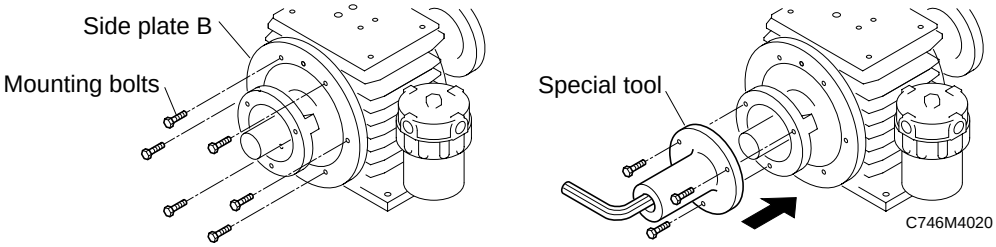
6 Remove the cooling fan cover and the cooling fan.



7 Remove the bearing retainers and liners.

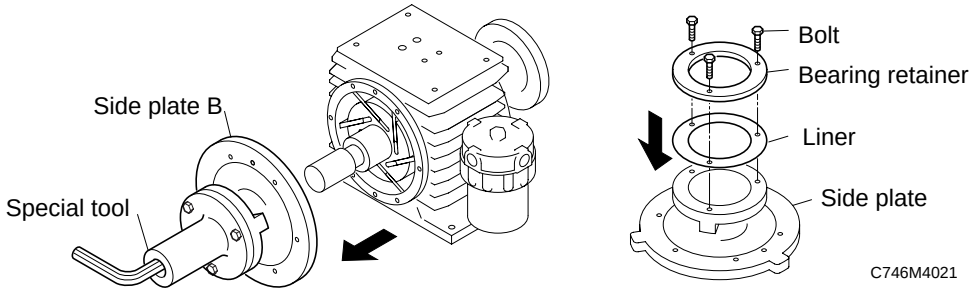


8 Remove the side plate "B" mounting bolts, then use these bolts to secure the special tool to side plate "B".



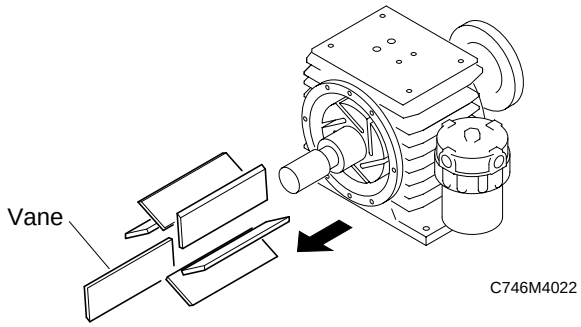
9 Pull on the special tool to remove side plate "B".

Remove the special tool from side plate "B", then install the bearing retainer and liner (removed at step 7 above) on side plate "B". Do not tighten the bolts fully at this time (back off 1 mm from fully tightened condition).



Note: Use care to avoid scratching side plate "B" and the inner surface of the cylinder.

10 Remove the vanes.

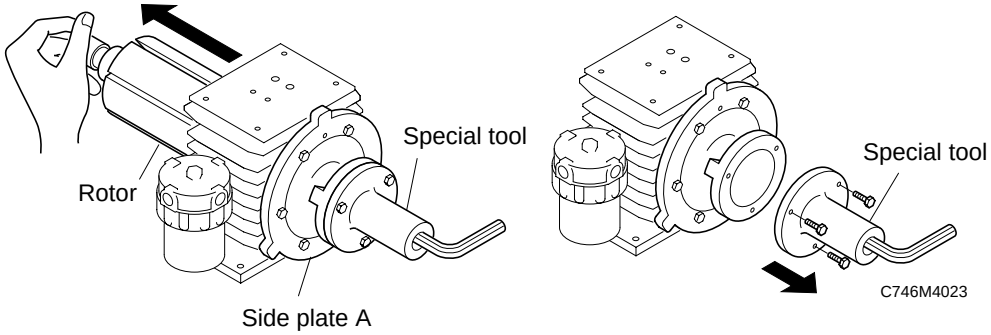


Note

1. Be sure to note the orientation and positions of the vanes, as the new vanes must be installed in the same manner.

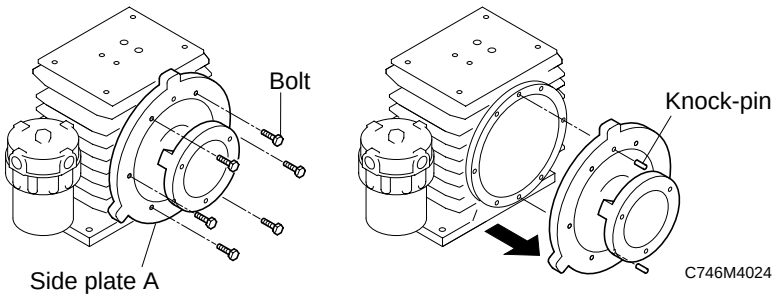
2. If a broken vane exists, air blow the pump interior to remove any fragments.

11 Mount the special tool on side plate "A", then push out the rotor. Support the shaft area with your hand to avoid dropping the rotor. After removing the rotor, remove the special tool.



NoteWhen pushing out the rotor, use care to avoid scratching the rotor shaft and the cylinder.

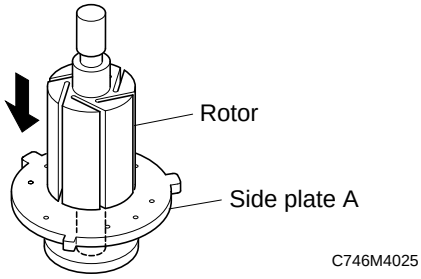
12 Remove the side plate "A" mounting bolts, and use a plastic hammer to knock the pin off, then remove side plate "A".



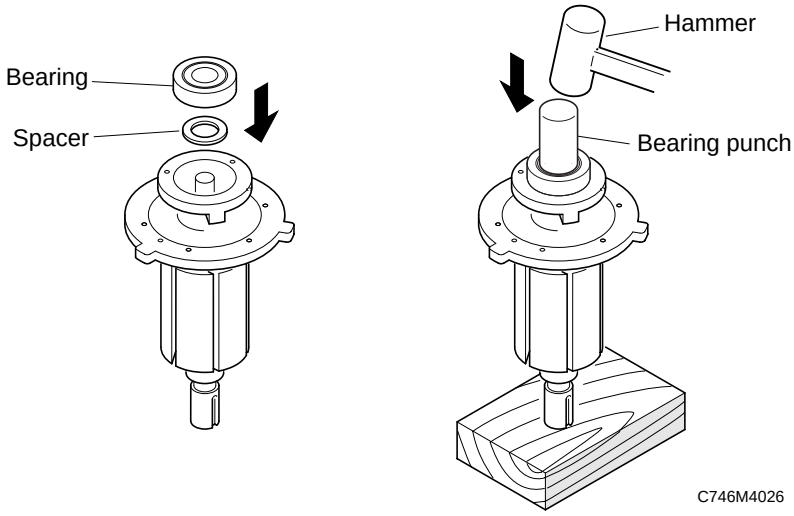
13 After disassembling to this point, clean each component using a soft cloth soaked in an organic solvent (chlorine or fluorine based solvent such as Kurorosen or Daifuron S3).

Assembly

1 Insert the rotor into side plate "A".

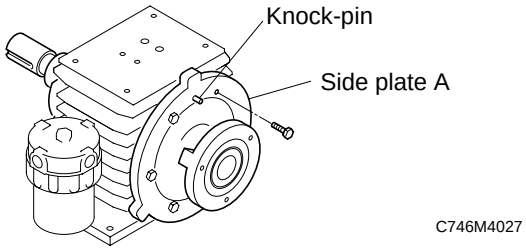


2 Place the spacer and bearing in side plate "A", then use a bearing punch and hammer to pound the bearing in.

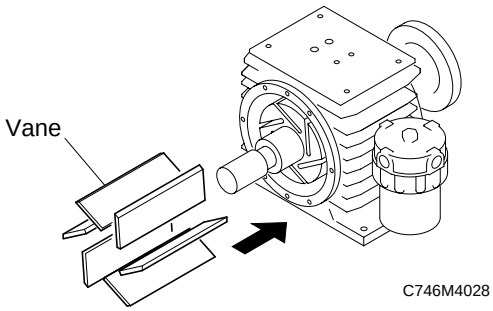


Note: Place a wood block beneath the shaft to prevent it from being scratched.

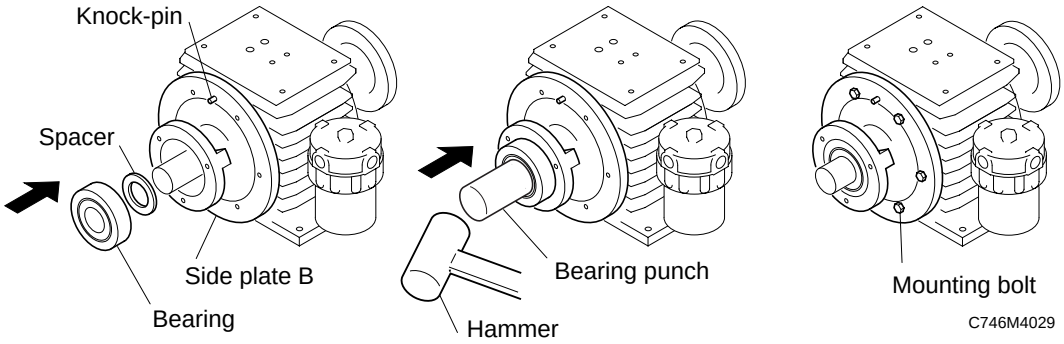
3 Mount side plate "A" on the cylinder. After using the knock-pin to position side plate "A", secure it with the bolts.



4 Mount the vanes on the rotor. Be sure the vane positions and orientations are the same as when disassembled.

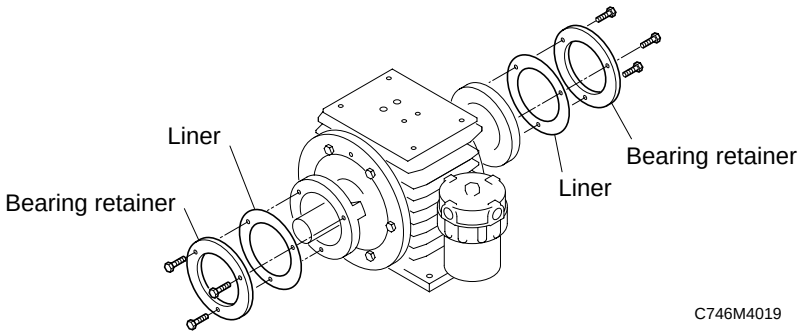


5 Mount side plate "B" on the cylinder. After using the knock-pin to position side plate "B", place the spacer and bearing in position, then use a hammer and bearing punch to pound the bearing in. After the bearing is in, secure the side plate "B" mounting bolts.



6 Use the bearing punch and hammer again to pound in the bearings at side plates "A" and "B".

7 Place the liners and bearing retainers on side plates "A" and "B".



Note: Even if the number of liners and their combinations are assembled in the same manner as when disassembled, there may be some looseness when the shaft rotates. The number of liners and the liner thickness should therefore be adjusted as necessary to eliminate this looseness.

Liner Thickness	0.03 mm	0.05 mm	0.10 mm	0.20 mm
Color Coded	Red	Yellow	Black	No color

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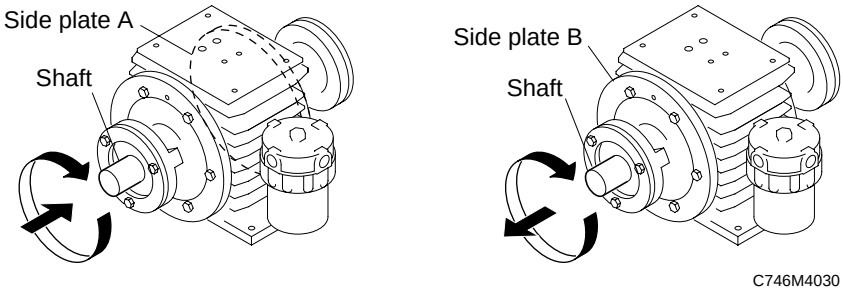
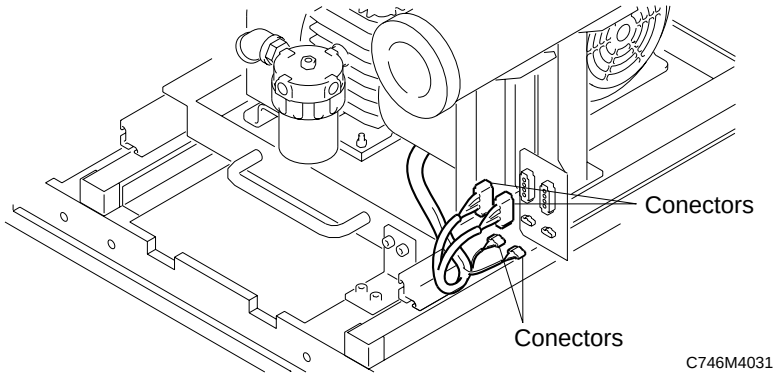
8 Verify that there is no contact between the rotor and the side plates when the rotor is rotated while pushing and pulling the rotor shaft.



9 Complete the vacuum pump reassembly by reversing steps 1 to 6 of the disassembly procedure, then reconnect the harness connectors.



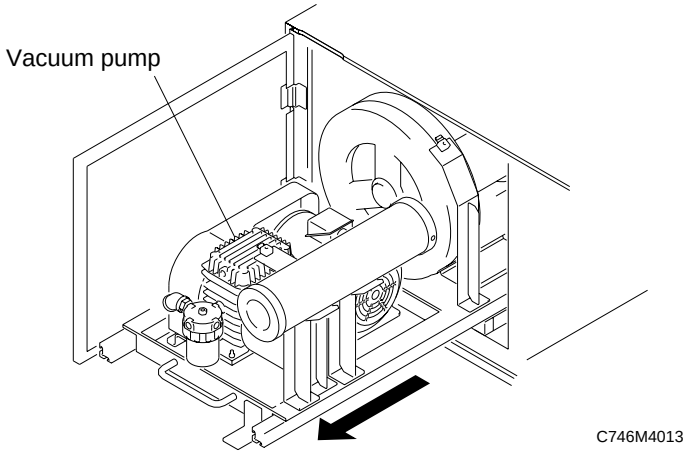
6.8 Vacuum Pump Motor

Procedure

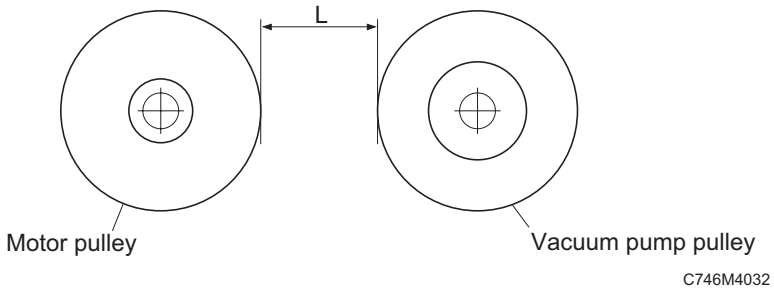
⚠ *WARNING*

- ***Be sure to switch off the 200V power supply before beginning this procedure.***
- ***Do not touch the vacuum pump immediately after operation as it may be extremely not. Allow the pump to cool before performing this procedure.***

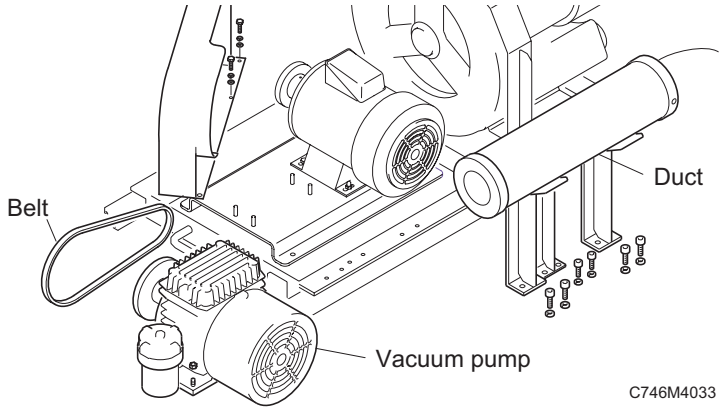
1 Pull out the vacuum pump. (For this procedure, refer to section 6.6 " Vacuum Pump Belt").



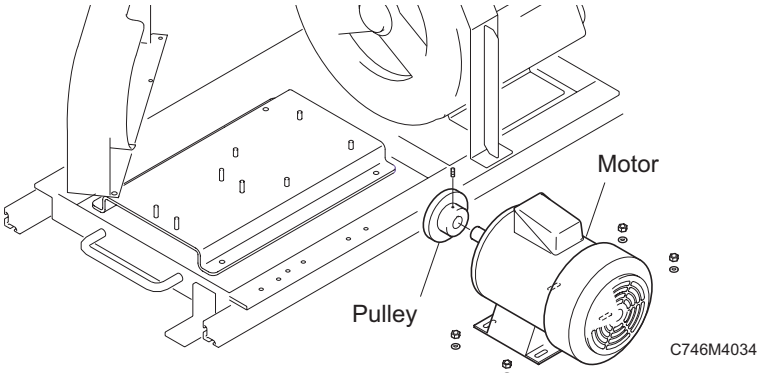
2 Use calipers to measure the distance between the vacuum pump pulley and the motor pulley, and make a note of this measured value.



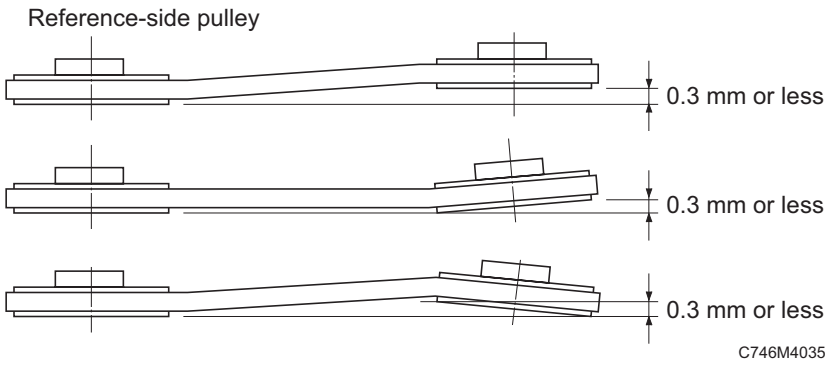
3 Remove all parts which hinder the motor replacement work. These parts include the vacuum pump, duct, the belt.



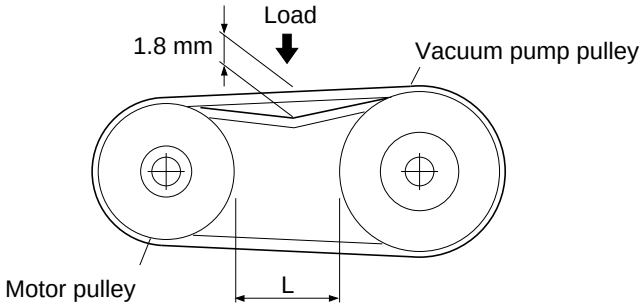
4 Remove the motor, then remove the pulley from the motor.



5 Mount the pulley on the new motor, then set the motor and vacuum pump on the base. Bolts which secure the pulley, motor, and vacuum pump should only be partially tightened at this time.
Final tightening should be performed after adjusting the pulley deviation and the distance between the vacuum pump pulley and motor pulley (distance noted at step 2). The pulley deviation should be 0.3 mm or less.5.Mount the pulley on the new motor, then set the motor and vacuum pump on the base. Bolts which secure the pulley, motor, and vacuum pump should only be partially tightened at this time.



6 Adjust the tension of the new belt. If the belt tension is outside the prescribed range, move the motor position in 0.1 mm increments to adjust the "L" dimension.



	New Belt	Belt During Use
Amount of slack	1.8 mm	1.8 mm
Load	0.50 ~ 0.60 kg	0.38 ~ 0.46 kg
Tension meter *	28 ~ 34 lb	20 ~ 26 lb

* : Polyflex tension meter manufactured by Gates Co.

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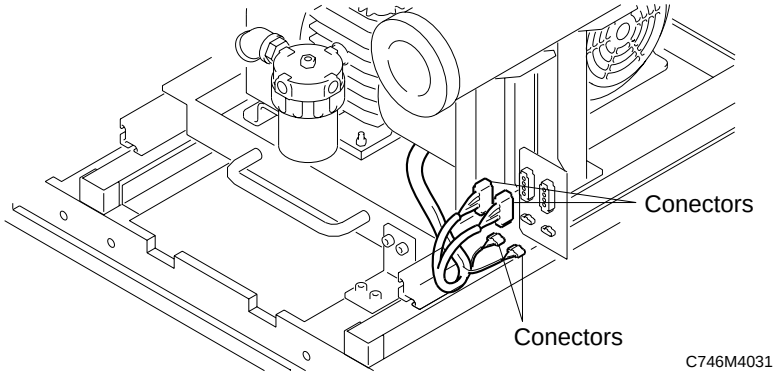
7 Reassemble the remaining parts in the reverse order of the disassembly procedure, then connect the harness connectors.



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6.9 Vacuum Hoses

Procedure

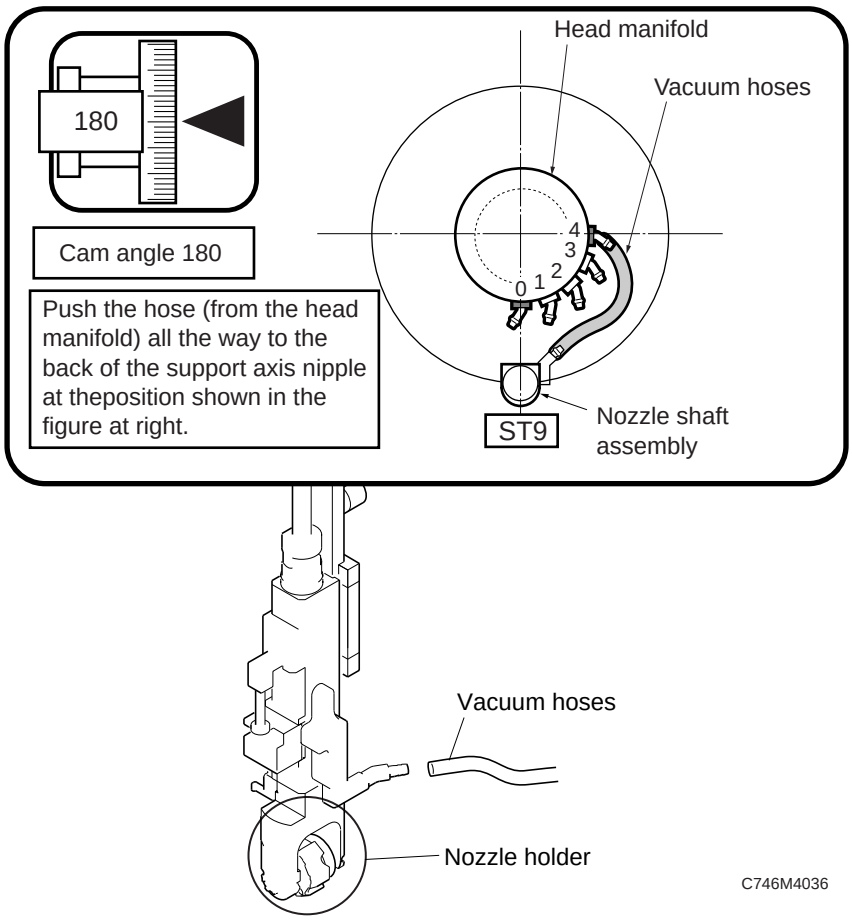
⚠ *WARNING*

- ***Be sure to switch off the 200V power supply before beginning this procedure.***
- ***The spring force may cause the cam axis to rotate if the cam axis is positioned anywhere other than the origin position (0 degrees). Always use extreme care when working inside the machine, as this is a dangerous area.***

1 Detach all nozzle holders.

2 Move the placing head where a vacuum hose is to be replaced to ST9, fix the cam angle at 180 degrees, then replace the vacuum hose between the head manifold and the nozzle shaft assembly.

3 Connect the vacuum hose to joint 4 as shown in the figure below.



6.10 Servo Amp Battery

Point

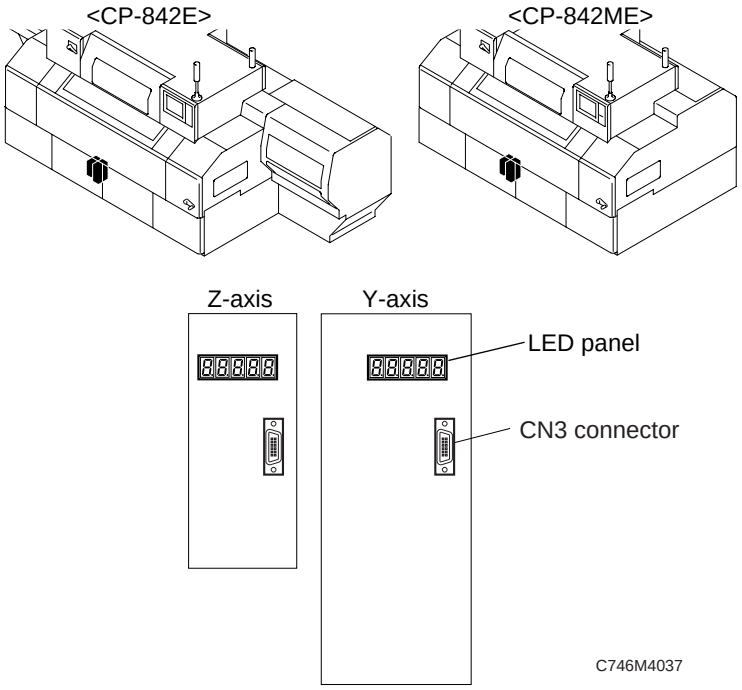
CP-842E/842ME machines use absolute encoder motors with servo amplifiers that are equipped with back-up batteries for saving the absolute encoder data even when the control power is off.

The servo amplifier battery should be replaced when a "Servo amp error" message displays on the machine operation screen, together with an "A.83" display at the servo amplifier's LED indicator.

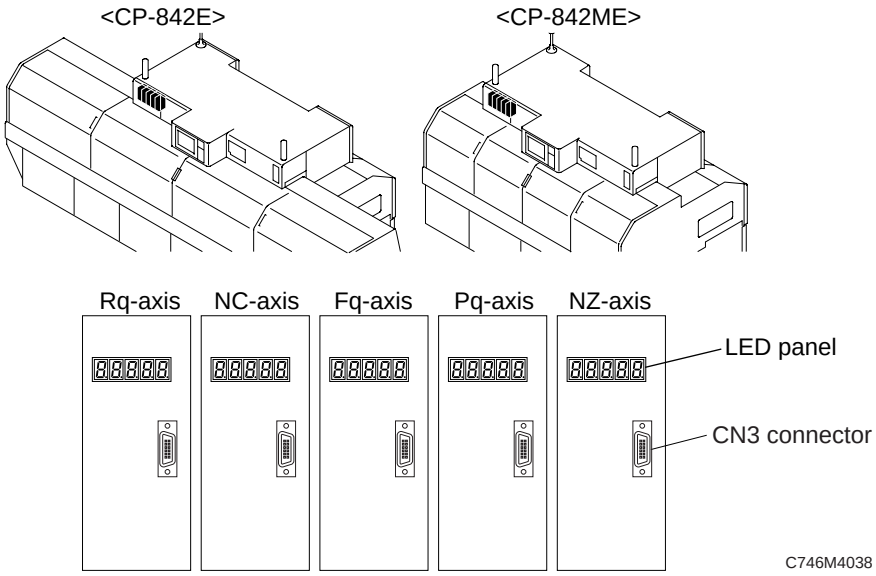
Caution:

1. *Following a servo amplifier error, the absolute data is saved for approximately 1 week after the machine power is turned off. Failure to replace the battery during this period will result in the loss of the absolute encoder data, and will require another absolute encoder setup and Proper data measurement. The battery should therefore be replaced quickly.*
2. *All the absolute encoder data will be lost If the old battery is removed while the servo amplifier's POWER LED is off, and another absolute encoder setup and Proper data measurement will then be required. To avoid this, ensure that the machine power is ON and that the POWER LED is lit when removing the old battery.*

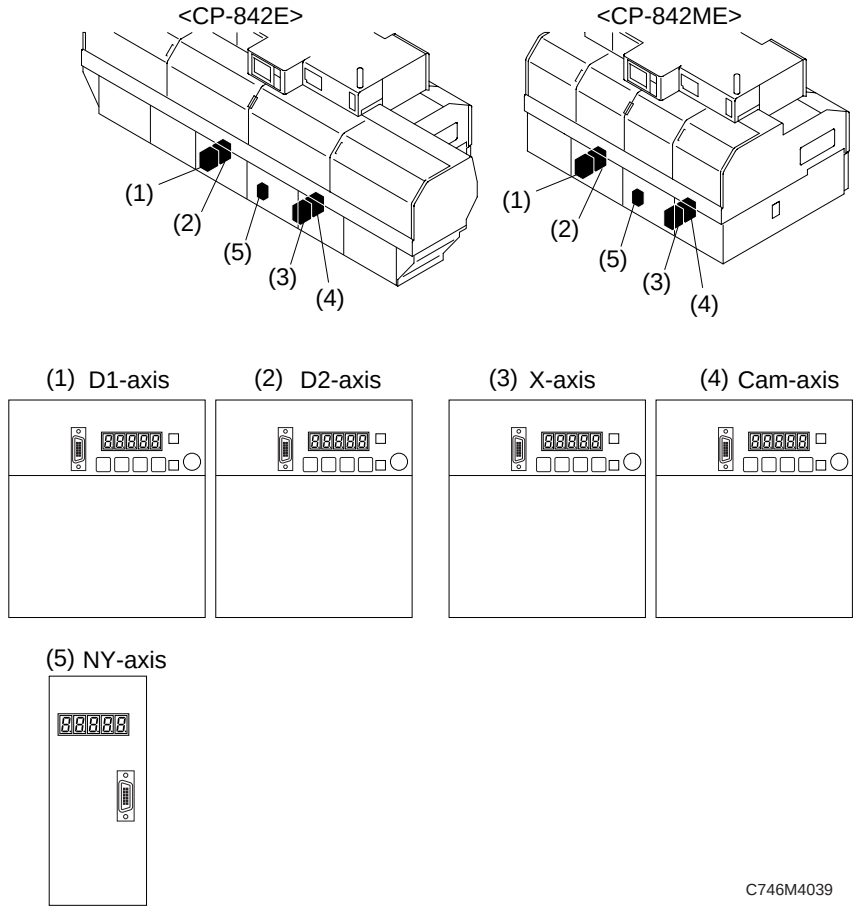
Y- and Z-Axis Servo amplifier



Rq-, NC-, Fq-, Pq-, and NZ-Axis Servo amplifier



D1-, D2-, X-, Cam-, and NY-Axis Servo amplifier



Procedure

Replace the servo amplifier battery with the machine power on.

1 Verify that the machine's [SYSTEM ON] lamp is on.

2 Press the machine's [EMERGENCY STOP] button.

⚠ *WARNING*

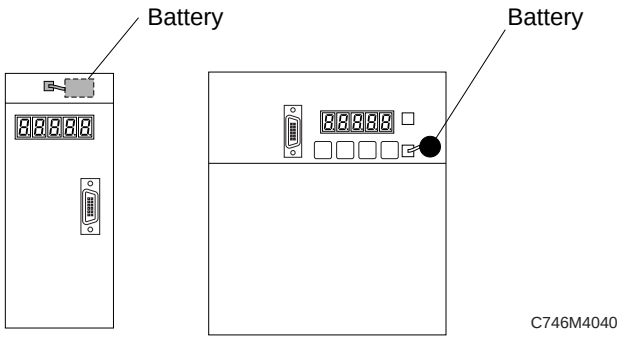
Be sure to switch off the 200V power supply before beginning this procedure.

3 Identify the servo amplifier where "A.83" is displayed at LED.

4 Locate the battery in the case located at the upper front of the servo amplifier, and replace it with a new battery.

CP-842E/842ME machines use the following 2 battery types in servo amplifiers

- Servo amplifier capacity: 30w to 5kw
  Model: JZSP-BA01
- Servo amplifier capacity: 6kw, 7.5kw
  Model: JZSP-BA01-01



Caution: All the absolute encoder data will be lost If the old battery is removed while the servo amplifier's POWER LED is off, and another absolute encoder setup and Proper data measurement will then be required. To avoid this, be sure that the POWER LED is on before removing the old battery

5 Turn the machine power off. Reboot the machine, and verify that the "A.83" alarm has cleared.

6 Press the [READY ON] switch to turn on the motor power. If machine operation is normal, the procedure is complete.

6.11 Replacing the Carrier Clamp/Unclamp Air Cylinder Packings

Point

Replace these packings if a carrier air cylinder is not working properly.

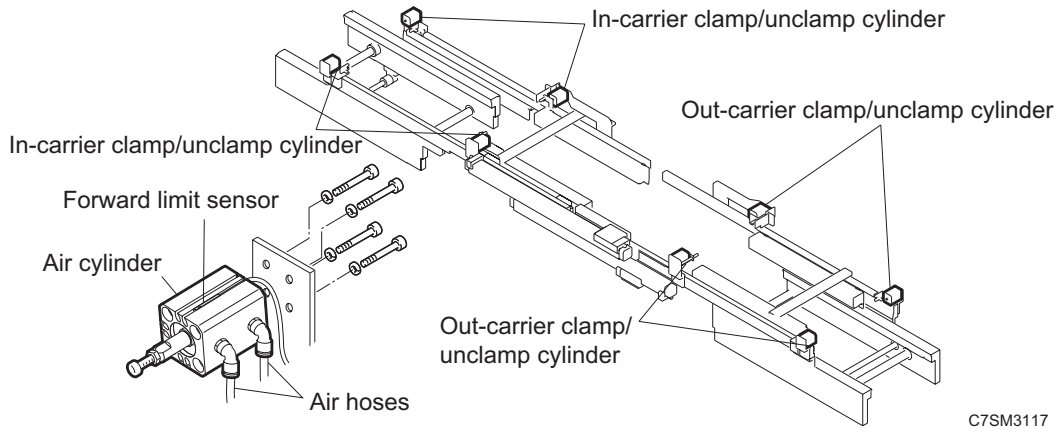
Procedure

⚠ *WARNING*

Press the EMERGENCY STOP button to turn off the servo power before beginning this procedure.

1 Close the air inlet valve lever and remove the air hose. Next, gradually open the valve lever to release the air pressure.

2 Remove the 4 bolts to remove the air cylinder from the in- or out-carrier bracket.

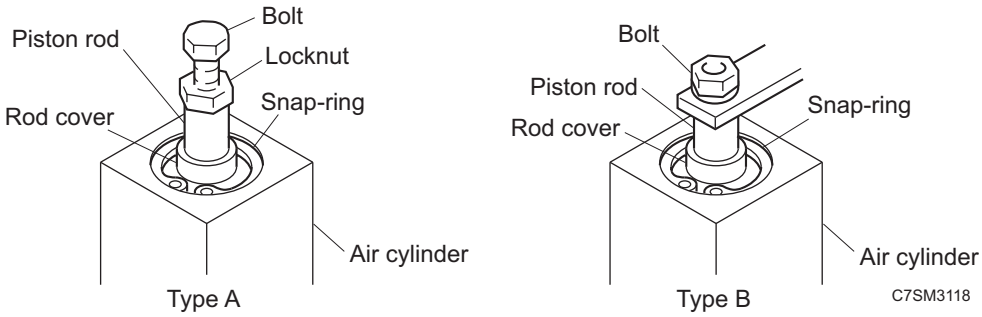


3 Disconnect the air hoses and remove the forward limit sensor.

Note Make a note of the air hose connections before disconnecting them, in order to prevent reconnecting them in the wrong positions.

4 Loosen the locknut at the end of the piston rod (for type A cylinders), and remove the bolt.

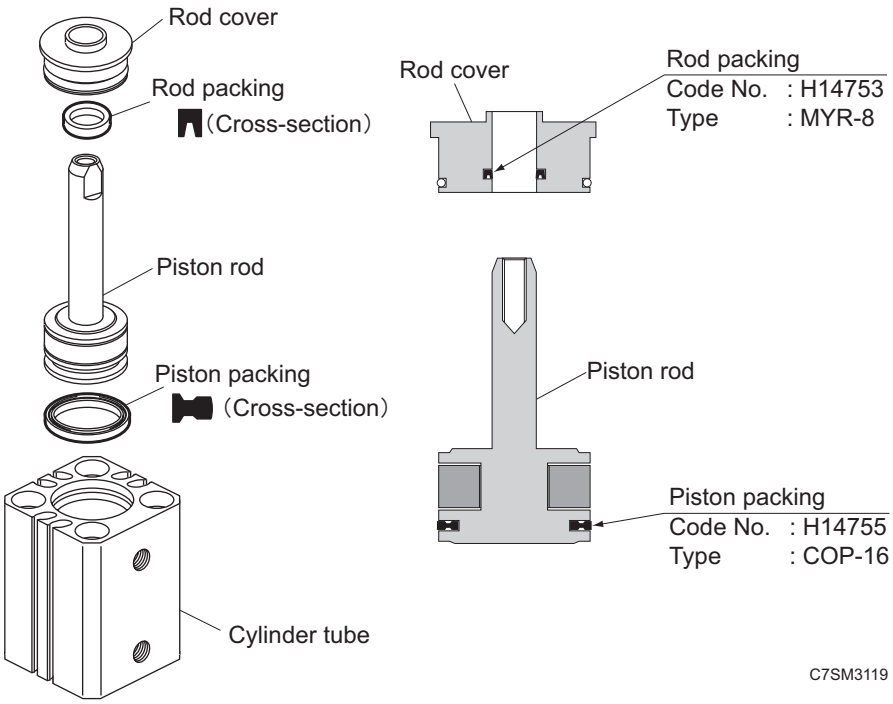
5 Use a snap-ring pliers to remove the snap-ring from the cylinder.



6 Remove the piston rod, and then remove the rod cover from the piston rod.

Note Do not force the rod cover off if it does not slide off the end of the piston rod smoothly. Remove any burrs from the beveled end with a whetstone or sandpaper.

7 Remove the packings from the rod cover and piston rod.

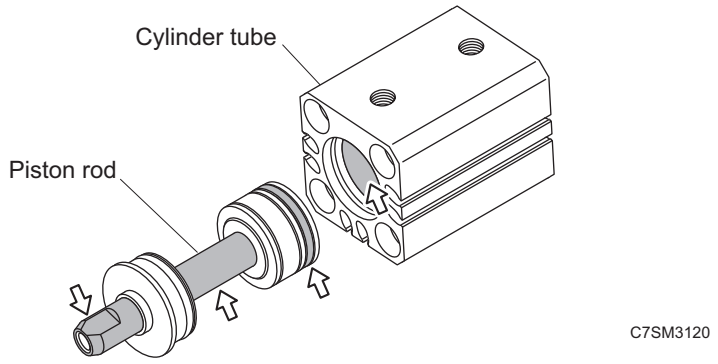


8 Clean the rod cover, piston rod, and cylinder tube.

9 Apply Daphne Eponex No. 2 grease uniformly to the rod and piston packings, and then mounting them in the rod cover and on the piston rod.

Note Do not damage or twist the packings when mounting them. Also, the packings are directional, so be sure to mount them in the correct orientation.

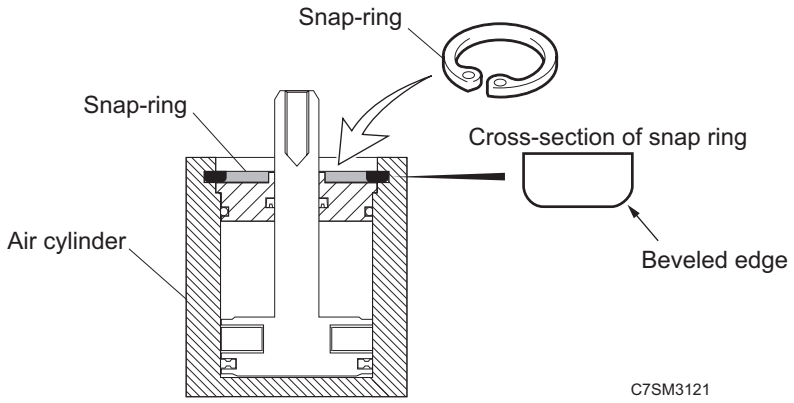
10 Apply a thin layer of Daphne Eponex No. 2 grease to the piston rod and inside of the cylinder tube.



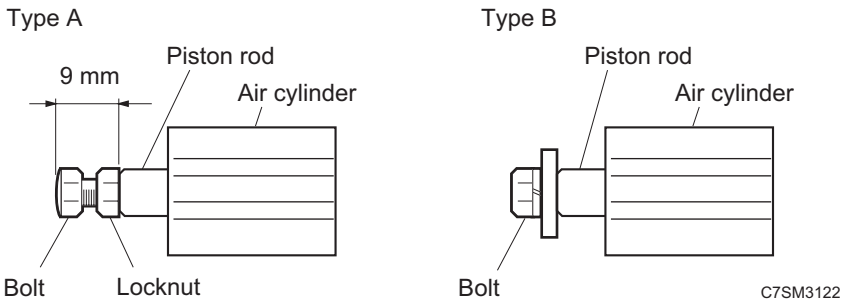
11 Assemble the rod cover on the piston rod, and then insert the piston rod in the cylinder tube.

12 Use a snap-ring pliers to assemble the snap-ring in the air cylinder.

Note The side of the snap-ring with beveled edges faces the air cylinder.



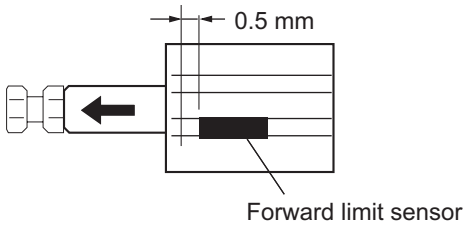
13 Type A carrier clamp/unclamp air cylinder: Adjust the distance from the end of the piston rod to the head of the bolt and lock the locknut.
Type B carrier clamp/unclamp air cylinder: Fasten the link bracket on the end of the piston rod.



14 Temporarily position the forward limit sensor.

15 Extend the piston rod, and slide the sensor until it turns ON.

16 Advance the sensor an additional 0.5 mm in the ON direction, and tighten the screw to lock the sensor in place.



[a] is the position where the sensor will come ON when the piston is extended.

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17 Connect the air hoses to the air cylinder.

18 Mount the air cylinder on the carrier bracket.

19 Connect the air hose and open the valve lever fully.

MEMO:

7. Adjustments

Specialized skills and jigs are required to complete machine adjustments.

Attempting adjustments without these skills and jigs may result in damage to the machine, so adjustments should only be performed by people who have received the appropriate training.

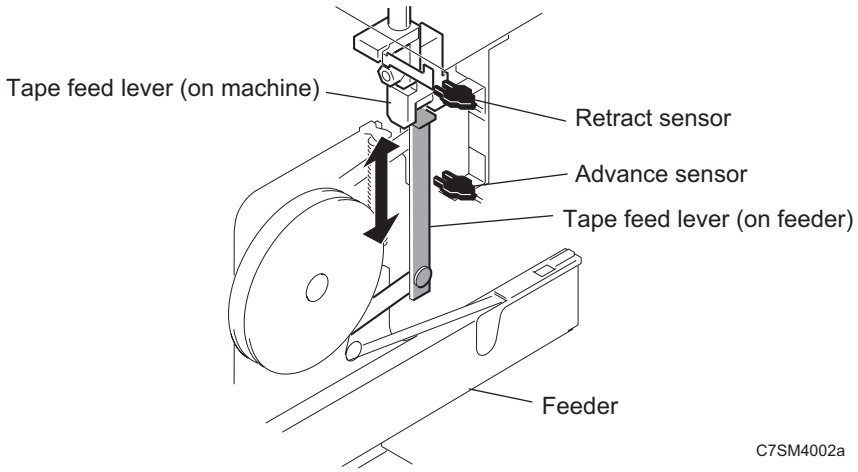
7.1 Station Adjustments

7.1.1 Tape Feed Lever (ST1)

Point

The pitch lever is the mechanism that advances the parts tape.

The vertical movement of this lever moves the part to the pick-up position. Two sensors are located in order to check if the tape feed lever reaches the advance limit and retract limit.



Rod Adjustment

1 Set the positioning jig (ADCPJ8020) in the D1 position.

2 Press [Position] - (Position) [D1-axis] - enter [1] - [OK] and the START button to move the positioning jig to station 1.

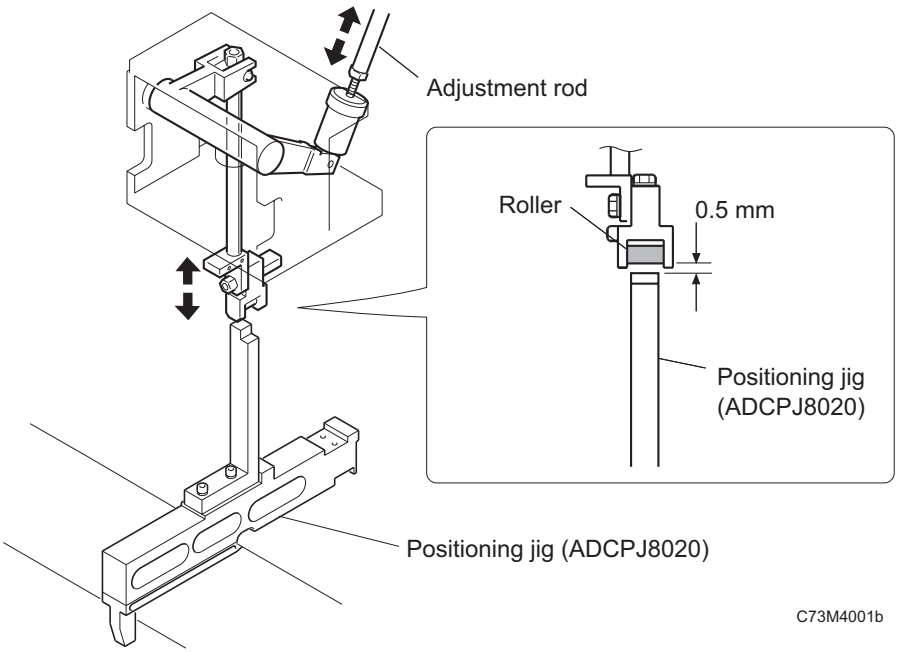
3 Press the EMERGENCY STOP button to take the 200V down to 100V.

> ⚠ ***WARNING***
>
> - ***Always be sure to cut off the 200V power before carrying out any work.***
> - ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

4 Use the cam handle to rotate the cam to 0°.

5 Switch the I/O (TAPE FEED SOL ON) setting ON.

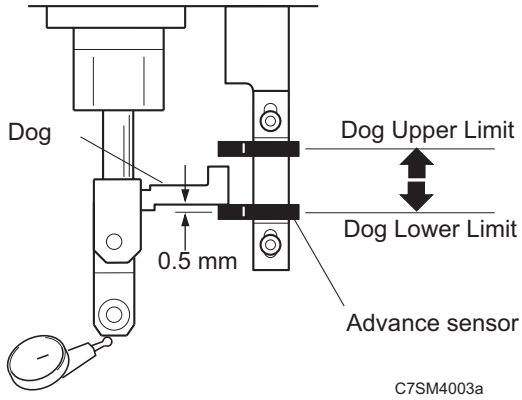
6 Adjust the rod so that there is 0.5 mm clearance between the top of the positioning jig and the roller.



Advance Sensor Position Adjustment

1 When the dog is at the lower limit at cam angle 200°, ensure that the sensor is ON.

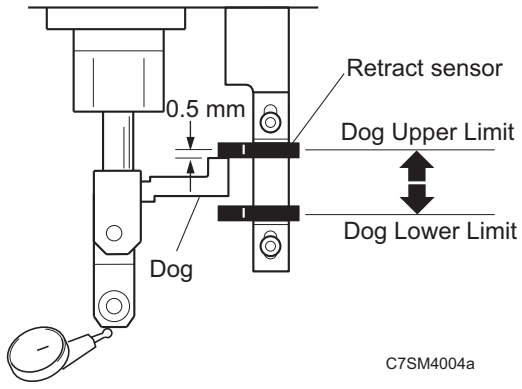
2 Set a dial gauge to the roller and adjust the sensor to go off 0.5 mm above the lower limit.



Retract Sensor Position Adjustment

1 When the dog is at the upper limit at cam angle 0°, ensure that the sensor is ON.

2 Set a dial gauge to the roller and adjust the sensor to go off 0.5 mm below the upper limit.

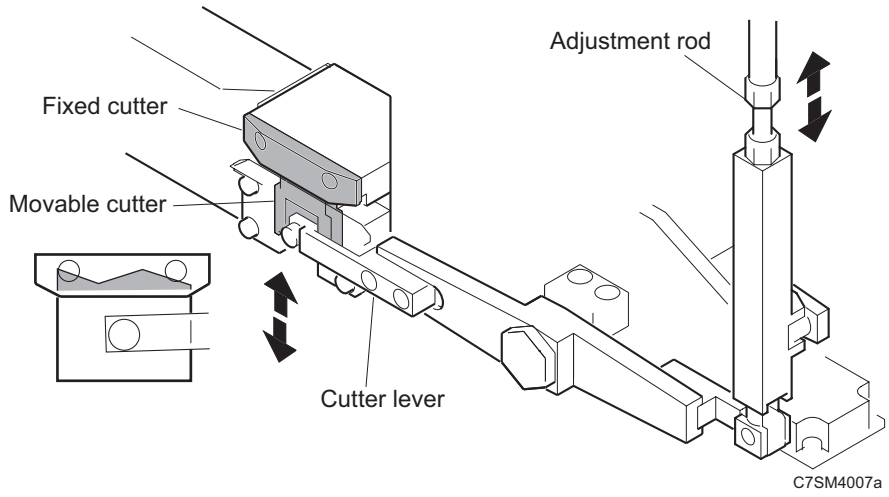


7.1.2 Waste Tape Cutter (ST1)

Point

The waste tape cutter cuts waste tape that protrudes from feeder tips. A vacuum takes the cut tape into the waste tape box at the front side of the machine.

Rotate the adjustment rod to align the movable blade with the fixed blade.



Adjustment Procedure

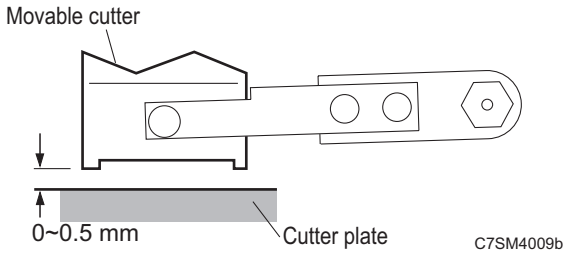
1 Press the EMERGENCY STOP button. This cuts the 200V servo power and leaves on only the 100V power supply.

⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

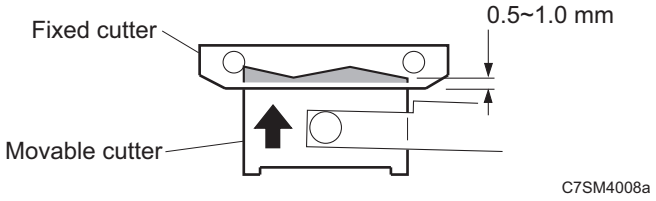
2 Use the cam handle to rotate the cam to 0°.

3 Ensure that there is a gap of 0 ~ 0.5 mm between the movable cutter lower surface and the cutter unit base.

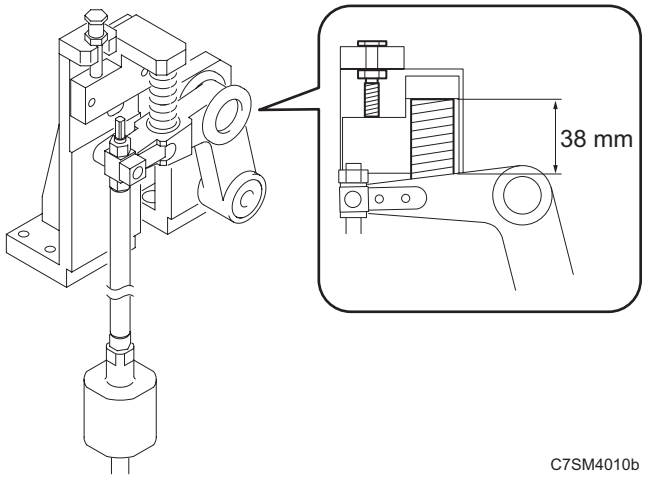


4 Use the cam handle to rotate the cam to 194°.

5 Adjust the rod so that the movable blade and fixed blade engages by 0.5 to 1.0 mm.



6 Ensure that the spring length is 38 mm.



7.1.3 Nozzle Vertical Movement During Pickup (ST1)

Slider Adjustment

Adjust the height of the slider to ensure that the cam follower can travel smoothly through the slider and along the cam groove.

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

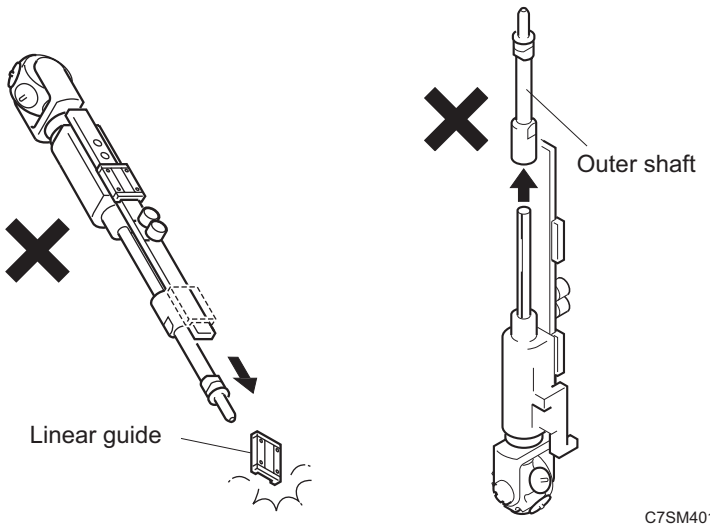
> ⚠ ***WARNING***
>
> - ***Always be sure to cut off the 200V power before carrying out any work.***
> - ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

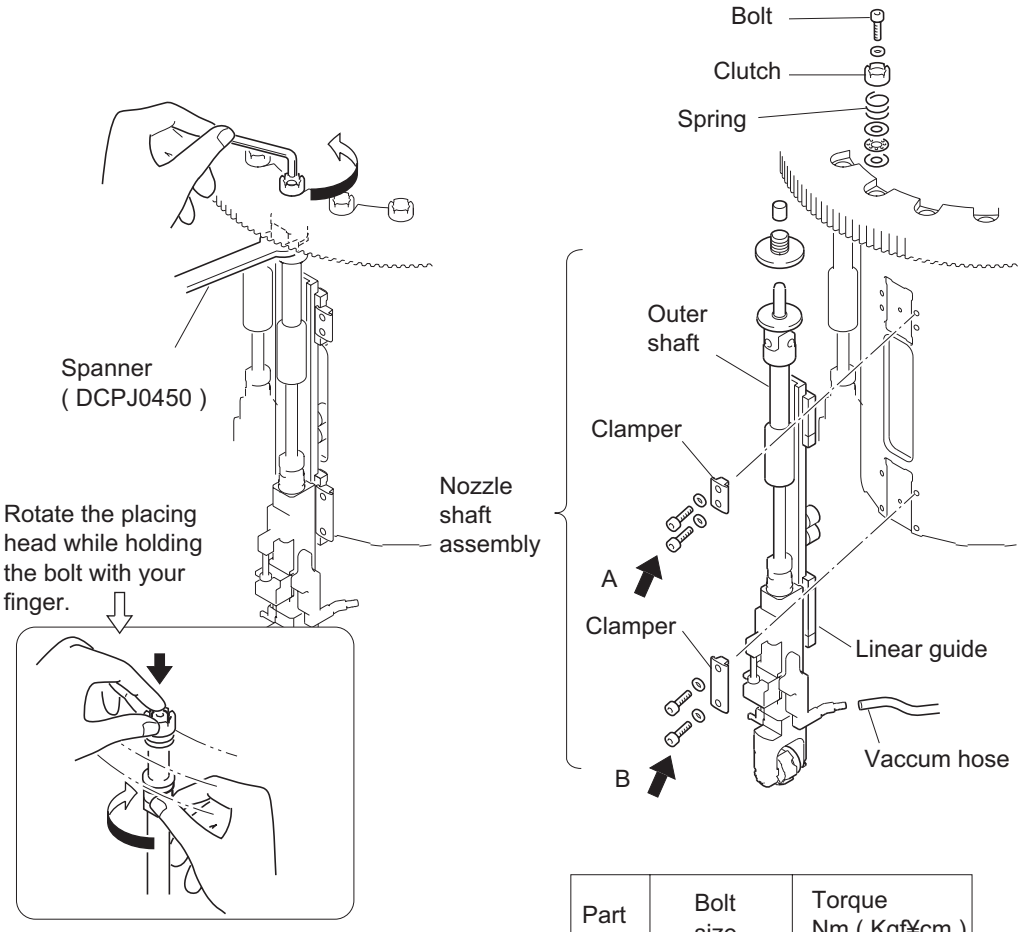
2 In order to remove the nozzle shaft assembly, it is first necessary to remove the upper clutch. Set the cam angle to zero degrees and use a spanner (DCPJ0450) to loosen the bolt on the nozzle shaft moving from station 9 to station 10. Turn the loosened bolt by hand and then remove the clutch. (see next page illustration)

Caution:Remove the nozzle shaft assembly which bears either a "G" or "O" identifier seal. Operations may be complicated if other nozzle shaft assemblies are removed.

3 Remove the linear guide clampers and vacuum hose, then remove the nozzle shaft assembly.

Caution:When handling the nozzle shaft assembly exercise caution to ensure that the linear guide and outer shaft do not become separated.



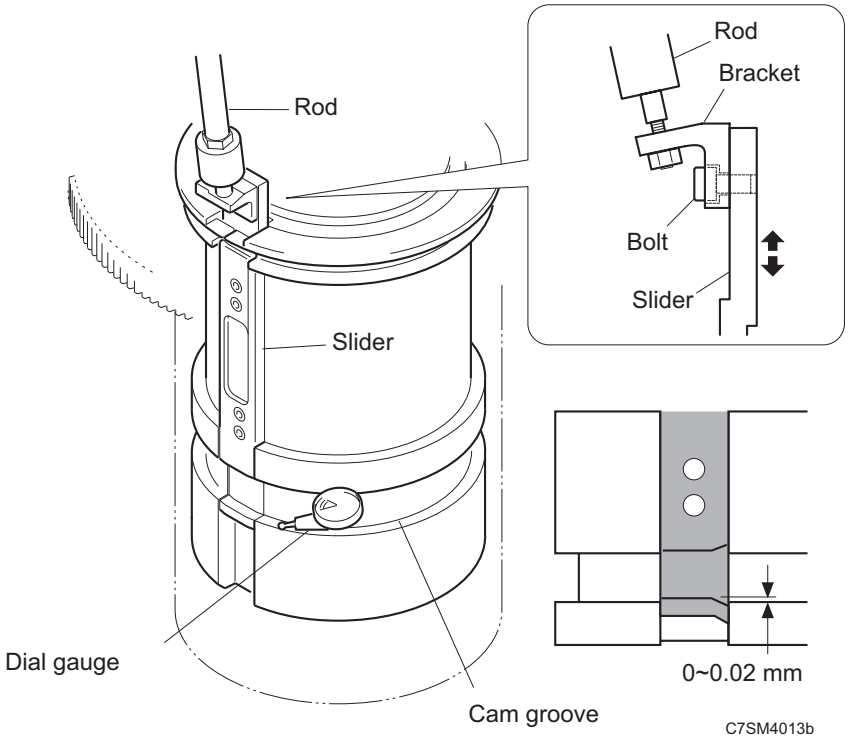


Caution : Washers may jump when the bolt is loosened because of the spring under the clutch.

Part	Bolt size	Torque Nm (Kgf¥cm)
A	M4	2 (20)
B	M4	2 (20)

C7SM4012a

Caution: Do not disassemble the placing head assembly carelessly. Special equipment and skills are required to perform the reassembly of the placing head. Such procedures should be attempted only by users who have attended training at Fuji and are equipped with the necessary tools, or whilst under the direct guidance of a serviceman.



4 Move the area for the removed placing head to ST1, then turn on the solenoid Y031 ST1 PICKUP SOL ENGAGED.

5 Set the cam angle to 0°, and position the dial gauge as shown in the figure above.

6 Check that the distance between the cam channel on the slider and the fixed cam channel is 0 to 0.02 mm. If this range is exceeded, loosen the bolt on the rod bracket and make the required adjustments to the height of the slider.

7 Tighten the bolt whilst maintaining the height of the slider.

8 Check the distance between the cam channels again.

Note: If the distance between the channels still does not fall within the range then it may be necessary to adjust the unit that controls the vertical movement of the nozzle.

9 Reattach the placing head assembly in the original location. Use the clutch alignment jig and reverse the removal procedures to attach the placing head.

Caution:The nozzle shaft assembly is exclusive to the CP-842E/842ME, and cannot be used on other machine types, such as CP-733E, CP-743ME, or CP-743E.

Confirming the Pick-up Height

Ensure that the nozzle descends low enough to pick up a part set in the feeder. Confirm that the mechanical valve movement creates a vacuum for part pick-up.

1 Set a W8 x P4 mm feeder (with tape leaf removed) at the D1 position.

2 Move the feeder to ST1 by pressing [Position] - (Position) [D1-axis] - enter [1] - [OK] - START.

3 Check that the NZ-axis is stopping at the position specified at the "PICK UP POS. NZ" item in Proper data.

4 Push the EMERGENCY STOP button, which disables the 200V power but leaves the 100V power on.

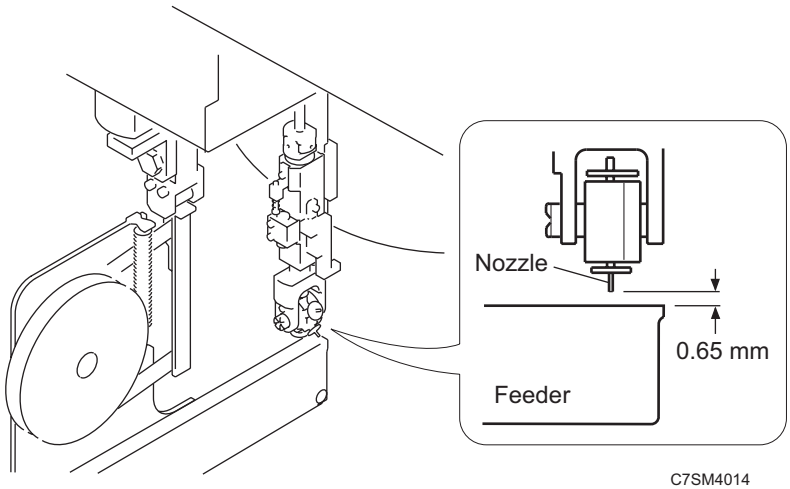
⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

5 Set the cam angle to 0 degrees, then turn the first nozzle solenoid valve on to work the cam lever.

6 Use the cam handle to rotate the cam to 170°.

7 Use a thickness gauge to ensure a space of 0.65 mm between the tip of the nozzle and the feeder (pick-up height).



Adjusting the Nozzle UP Limit Sensor

The sensor which detects the height of the nozzle UP/DOWN rod is mounted inside the cam box. Adjust the sensor's mounting position so that the sensor switches ON when the nozzle is at its UP limit.

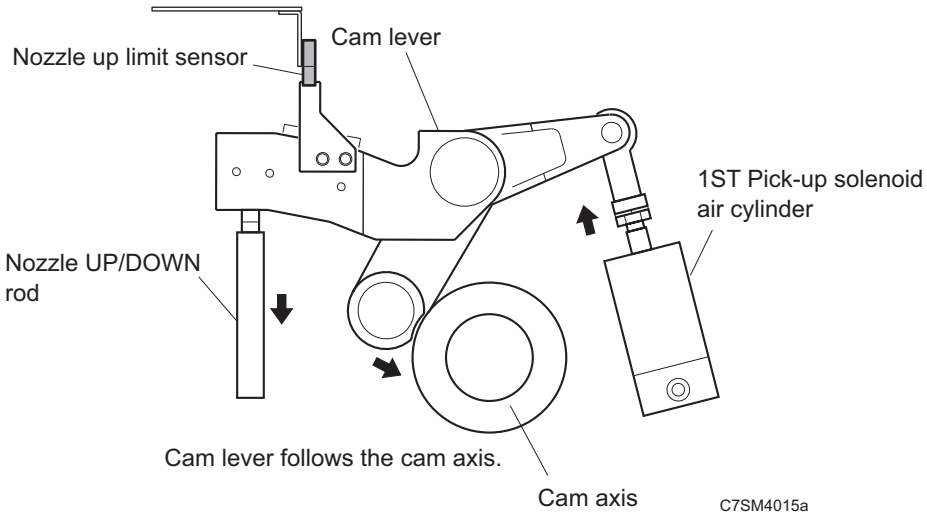
1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

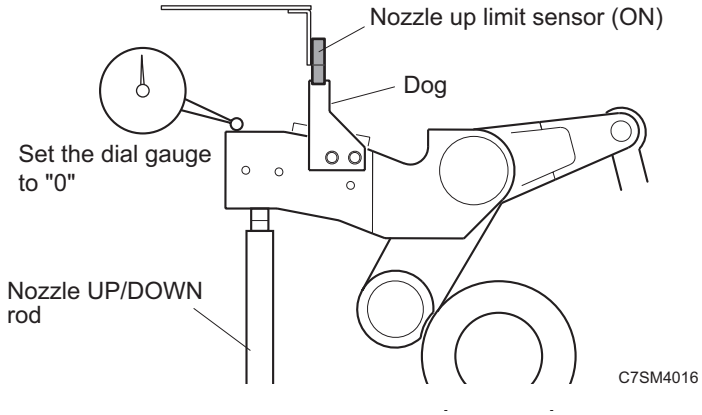
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the cam axis at the 0-degree position.

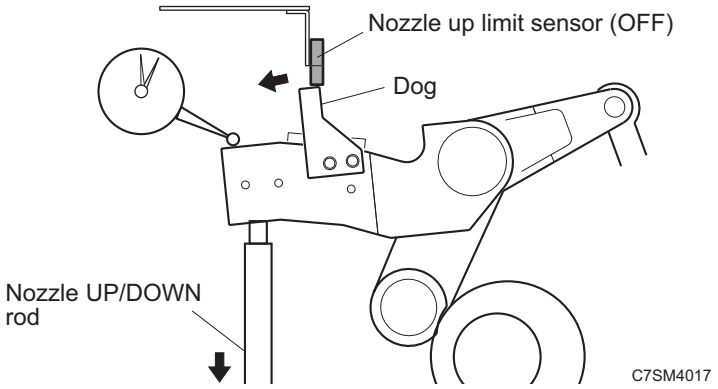
3 Activate the ST1 pick-up solenoid air cylinder (located in the cam box):



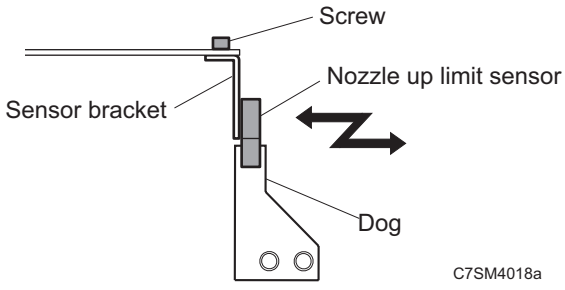
4 Place a dial gauge on the top end of the cam lever and set the gauge reading to "0". In this condition, the cam axis will be at its 0-degree position, and the nozzle UP/DOWN rod will be at its UP limit position. Verify that the nozzle UP limit sensor is ON (X030 ST1 CYLINDER UPPER-LIMIT is ON) at the I/O screen.



5 While observing the dial gauge, rotate the cam axis in the forward direction to lower the nozzle UP/DOWN rod. Adjust the sensor's mounting position so that the sensor switches OFF (X030 ST1 CYLINDER UPPER-LIMIT switches OFF) when the rod has been lowered 0.3 to 0.4 mm.



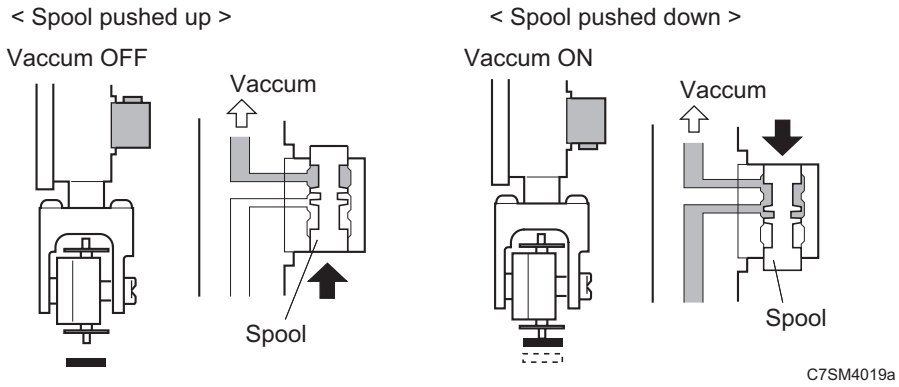
6 Adjust the sensor's mounting position by loosening the sensor lock screw and sliding the sensor in the front/back directions.



7.1.4 Mechanical Valve Switching (ST1)

Point

The nozzle vacuum goes from OFF to ON with the movement of the mechanical valve at station 1. Vacuum pressure for part pick-up forms inside the nozzle when the valve is open.



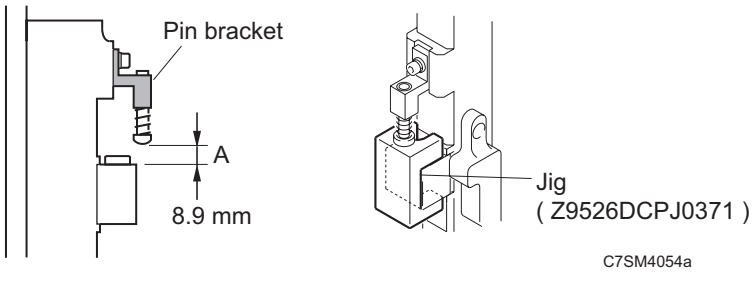
Checking the Position of the Pin Bracket

1 Press the EMERGENCY STOP button to turn off the 200V power, leaving only the 100V power on.

⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

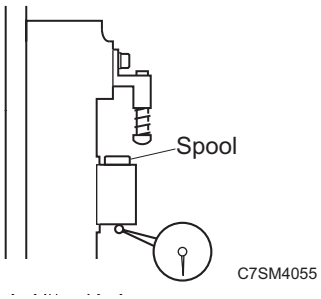
2 Ensure that distance A (as seen in the figure below) is 8.9 mm for all heads. Use a special jig (Z9526DCPJ0371) to check this distance.



Valve Switching Lever Height Adjustment

This adjustment should be performed on the reference head after completing adjustments to the vertical movement of the nozzle. (Refer to 1.4 “Nozzle Vertical Movement During Pickup” for details.)

The reference head can be identified by its height. All heads are measured with spools lifted, and the lowest one is referred to as the reference head.

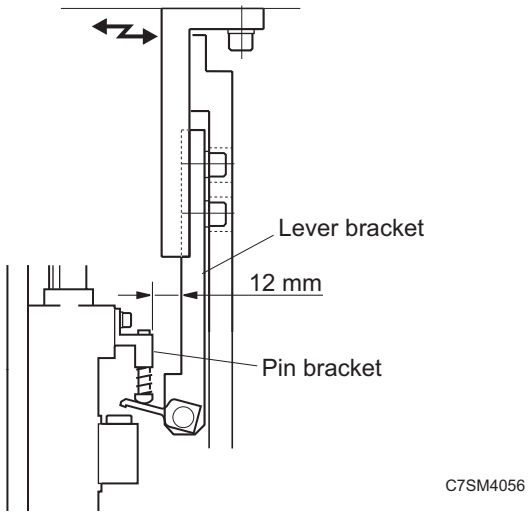


1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

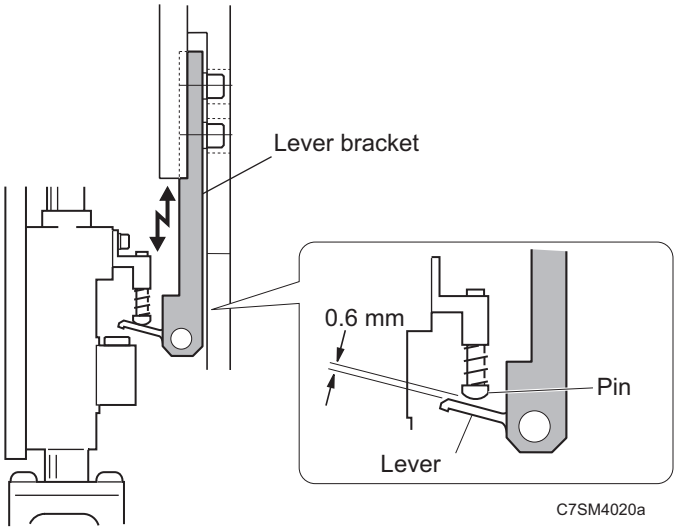
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Adjust the position of the lever bracket so that the distance from the pin bracket is 12 mm.



3 With the Y030 ST1 PICKUP SOL DISENGAGED ON, use the cam handle to rotate the cam to 170°.

4 Adjust the height of the bracket so that the distance between the lever and the pin is 0.6 mm.

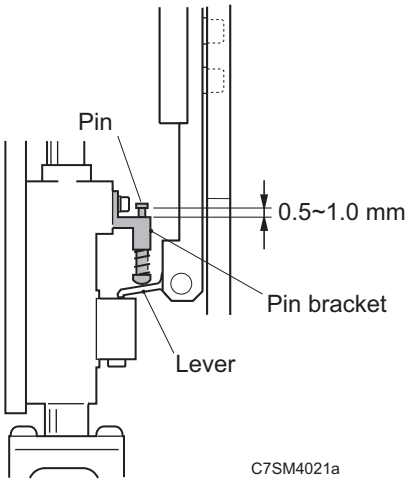


5 Return the cam angle to 0 degrees. Switch on the 1st nozzle UP/DOWN solenoid valve in order to work the cam lever.

Check the servo counter to verify that the Proper data (PICK UP POS. NZ) is at the pick-up height (approx. 4000 pulse position).

6 Use the cam handle to rotate the cam to 170 degrees.

7 Ensure that the clearance of the pin from the bracket is within the range of 0.5 to 1.0 mm after the pin has been raised by the lever.

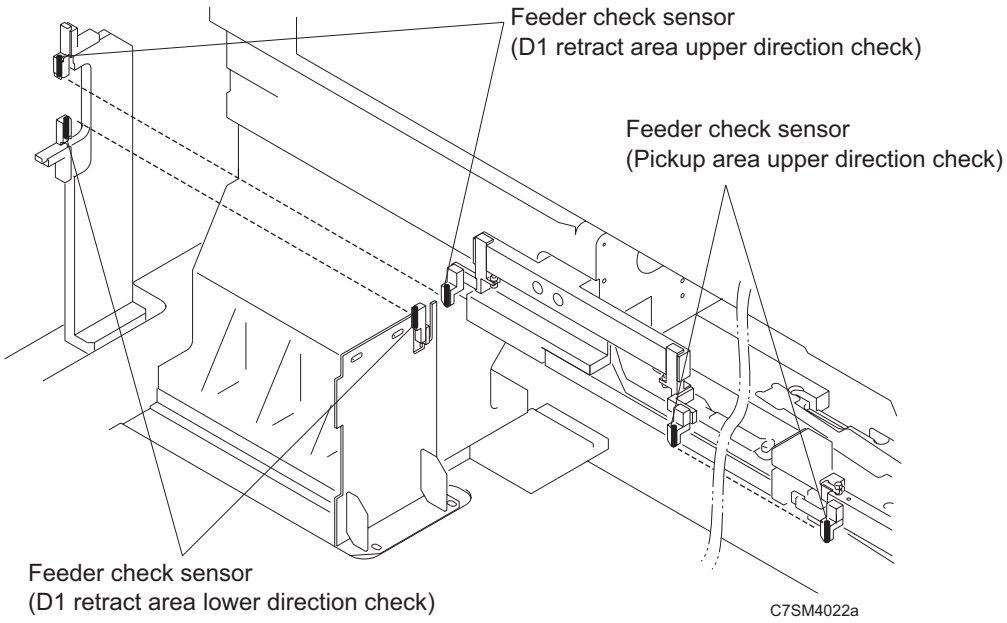


7.1.5 Feeder Height Error Detection (ST1)

Point

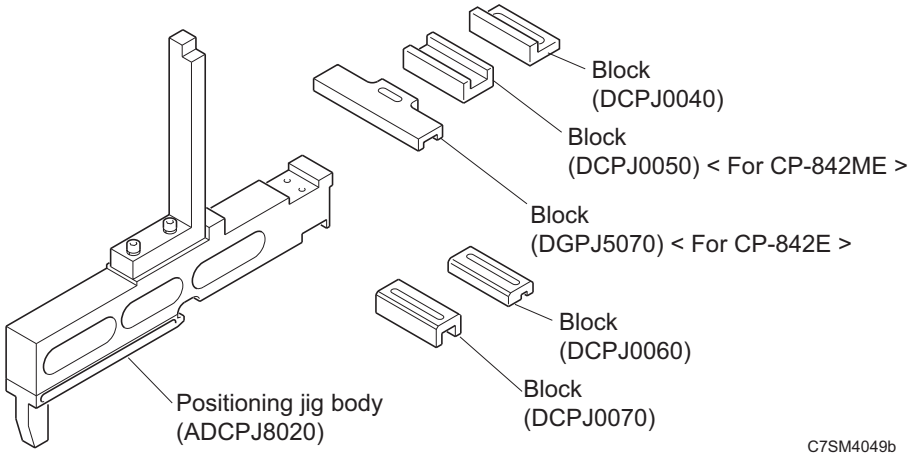
To detect the positions of the feeders, two sets of sensors are used at each of the retract areas. A further pair of sensors are also used at the pickup position, bringing the total number to five.

A dedicated jig is used to position these sensors. The sensitivity of the sensors must also be adjusted.



Note: This diagram shows the CP-842ME D1 arrangement, but the D2 arrangement is the same.

The jig used to adjust the sensor positions is shown below.



Feeder Check Sensor Position Adjustment

1 Press the EMERGENCY STOP button to turn off the 200V power, leaving only the 100V power on.

⚠ *WARNING*

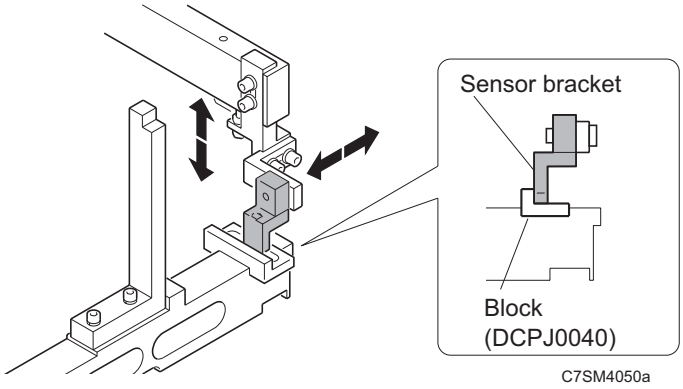
Always be sure to cut off the 200V power before carrying out any work.

2 Set the positioning jig body on a feeder pallet.

3 Use the inching keys to position the feeder pallet and bring the positioning jig body within the vicinity of the sensor in question.

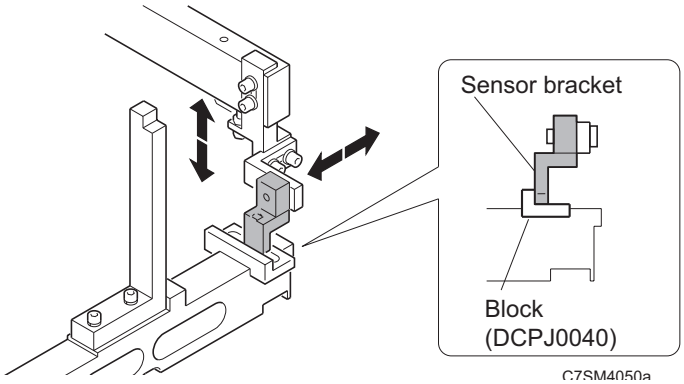
4 Attach a block appropriate for each sensor within the jig and then adjust the sensor position.

Pick-up Area



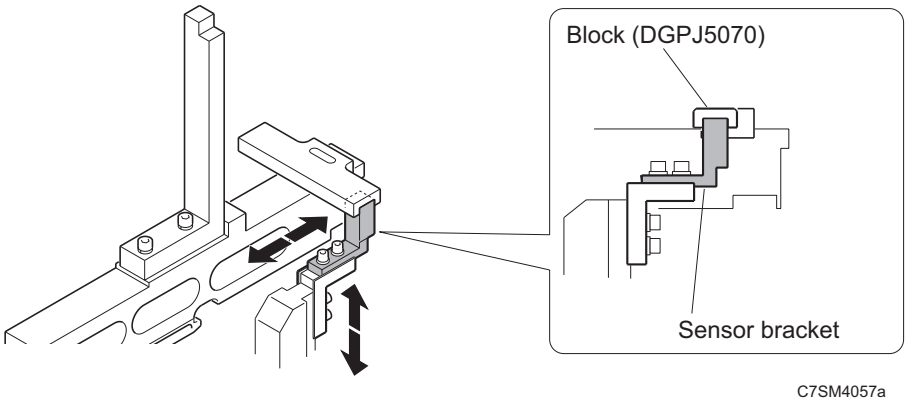
D1, D2 Retract Area (Upper direction check)

Inner sensor

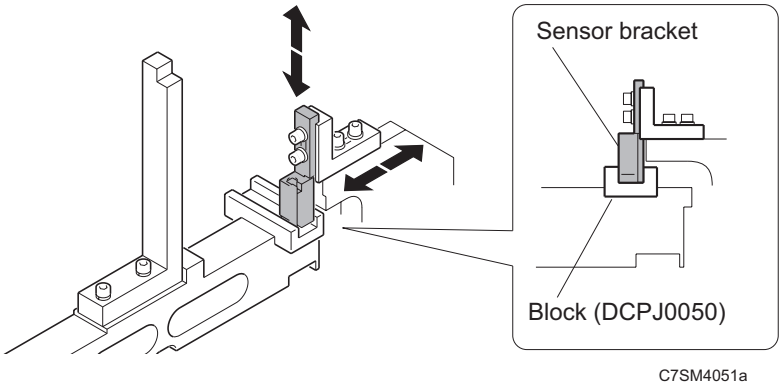


Outer sensor

<CP-842E>

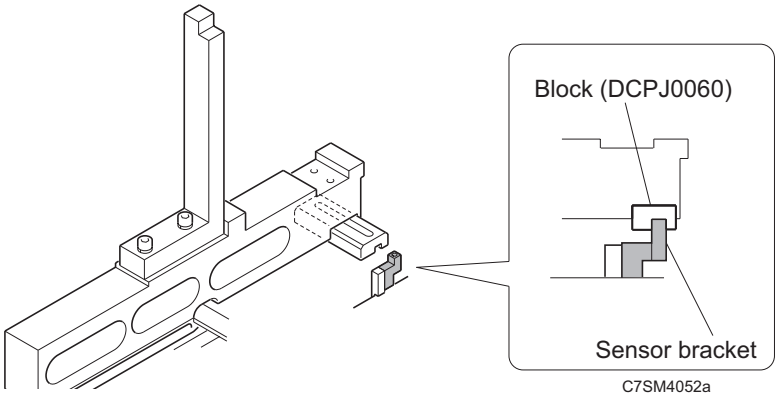


<CP-842ME>

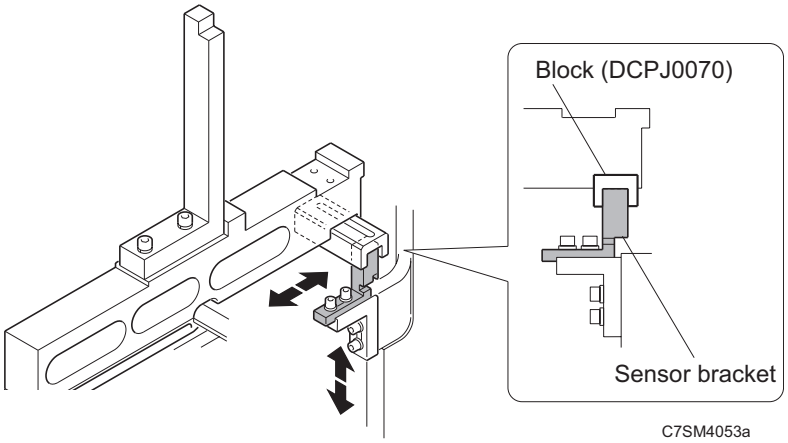


D1, D2 Retract Area (Lower direction check)

Inner sensor

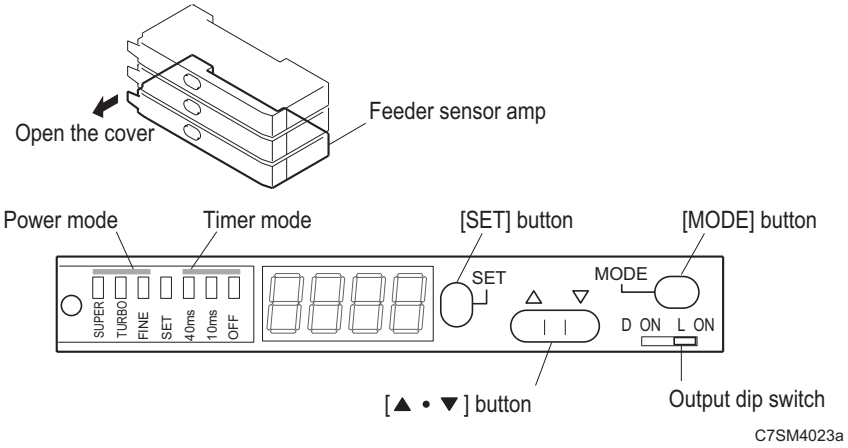


Outer sensor



Sensor Amp Adjustment

Open the front cover and follow the procedures below.



1 Check that the output dip switch is set to "L ON".

2 Set the power modes and timer modes as detailed below.

2-1. Press and hold down the MODE button for three seconds or more to change the display to "turb".

Use the up and down arrow buttons to set the power mode to "SUPER".

2-2. Press the MODE button to change the display to "dLy".

Use the up and down arrow buttons to set the timer mode to OFF.

2-3. Press the MODE button again to return the display to the original state.

3 Press the MODE button to toggle the display from the light value, to the percentage value (value + "P"), and then back to the light value.

Ensure that the figures for all the sensors are above the minimum values shown below.

- CP-842E
  Pickup area: 1000 digit (target: 2000 digit)
  Retract area: 30 digit (target: 100 digit)
- CP-842ME
  Pickup area: 1000 digit (target: 2000 digit)
  Retract area: 100 digit (target: 300 digit)

Note: The sensor should be replaced when the light reading is at approximately 4095.

Check the following items if the light reading does not reach the minimum required value.

a The position of the sensor bracket.

b Check that the sensor is correctly attached to the sensor bracket.

c The positioning of the fiber and attachment tips.

d Check whether the fiber and amp connections are correctly inserted.

e Check the condition of the fiber wiring.

4 Change the display to show the percentage value by pressing the mode button to toggle the display as required.

5 Use the up and down arrow buttons to set the value to 200 where no object interrupts the sensor.

Note: The arrow buttons cannot be used if the display reads 999P. In this situation, press the SET button twice to revert the display to 100P.

7.1.6 Large Parts Check Sensor (ST2)

Point

The machine has a sensor at station 2 that checks for large parts (1 mm or larger in height). The machine stops immediately if no part is detected.

Sensor Position Adjustment

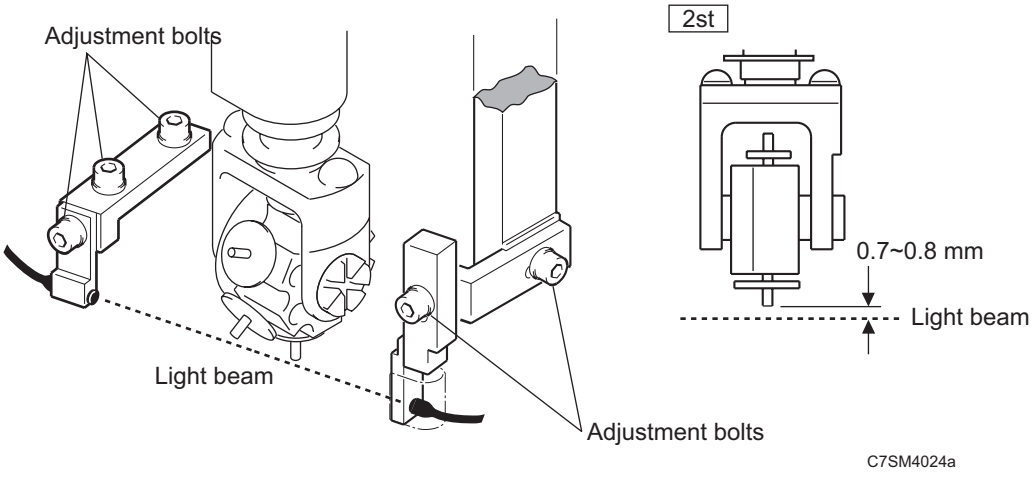
1 Press the EMERGENCY STOP button. This cuts the 200V servo power and leaves on only the 100V power supply.

> ⚠ ***WARNING***
>
> - ***Always be sure to cut off the 200V power before carrying out any work.***
> - ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Use the cam handle to rotate the cam to 200°.

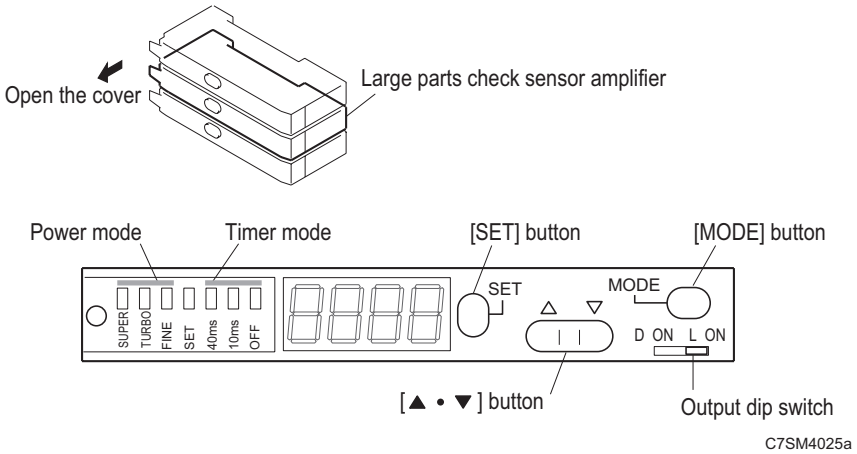
3 Adjust the sensor bracket positions so that the sensor beam goes through 0.7 ~ 0.8 mm below the nozzle tip. Use a thickness gauge etc. to ensure the sensor reaction while working.

4 Actually pick up a large part to check the sensor reaction.



Sensor Amp Adjustment

Open the front cover and follow the procedures below.



1 Check that the output dip switch is set to "L ON".

2 Set the power modes and timer modes as detailed below.

2-1. Press and hold down the MODE button for three seconds or more to change the display to "turb".

Use the up and down arrow buttons to set the power mode to "SUPER".

2-2. Press the MODE button to change the display to "dLy".

Use the up and down arrow buttons to set the timer mode to OFF.

2-3. Press the MODE button again to return the display to the original state.

3 Press the MODE button to toggle the display from the light value, to the percentage value (value + "P"), and then back to the light value.

Ensure that the figures for all the sensors are above the minimum values shown below.

200 digit (target: 500 digit)

Note: The sensor should be replaced when the light reading is at approximately 4095.

Check the following items if the light reading does not reach the minimum required value.

a The position of the sensor bracket.

b Check that the sensor is correctly attached to the sensor bracket.

c The positioning of the fiber and attachment tips.

d Check whether the fiber and amp connections are correctly inserted.

e Check the condition of the fiber wiring.

4 Change the display to show the percentage value by pressing the mode button to toggle the display as required.

5 Use the up and down arrow buttons to set the value to 200.

Note: The arrow buttons cannot be used if the display reads 999P. In this situation, press the SET button twice to revert the display to 100P.

7.1.7 Pre-theta Movement (ST2)

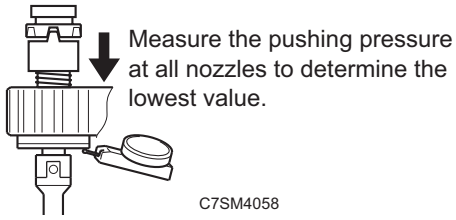
Point

Pre-theta rotates the nozzles with parts picked up at station 1 by 90°, 180° or -90° depending on the settings in the production program.

Clutch Meshing Check

Perform this check on the low-pressure nozzle.

Note: The low-pressure nozzle refers to the placing head (out of the 16) that receives the weakest pushing pressure. Use the low-pressure nozzle for meshing checks at ST2, 8 and 10.



1 Press the EMERGENCY STOP button to take the 200V down to 100V.

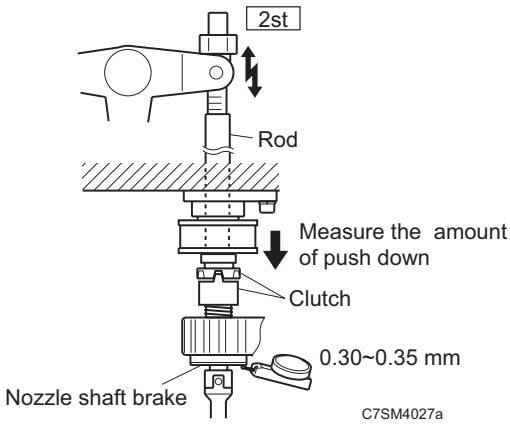
⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the dial gauge to the bottom of the nozzle shaft brake.

3 Use the cam handle to rotate the cam to 200°.

4 Ensure that the clutches mesh properly and the placing head assembly deflects the dial gauge by 0.30 ~ 0.35 mm as illustrated below.



7.1.8 Fine-theta Movement (ST8)

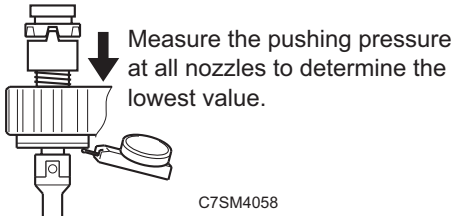
Point

Station 8 refers to the vision processing data at station 5 and rotates a part the remaining angle for placement.

Clutch Meshing Check

Perform this check on the low-pressure nozzle.

Note: The low-pressure nozzle refers to the placing head (out of the 16) that receives the weakest pushing pressure. Use the low-pressure nozzle for meshing checks at ST2, 8 and 10.



1 Press the EMERGENCY STOP button to take the 200V down to 100V.

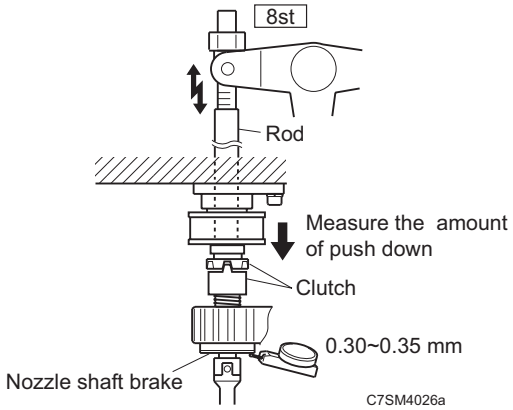
⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the dial gauge to the bottom of the nozzle shaft brake.

3 Use the cam handle to rotate the cam to 200°.

4 Ensure that the clutches mesh properly and the placing head assembly deflects the dial gauge by 0.30 ~ 0.35 mm as illustrated below.



7.1.9 Nozzle Vertical Movement During Placement (ST9)

Slider Adjustment

Adjust the height of the slider to ensure that the cam follower can travel smoothly through the slider and along the cam groove.

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

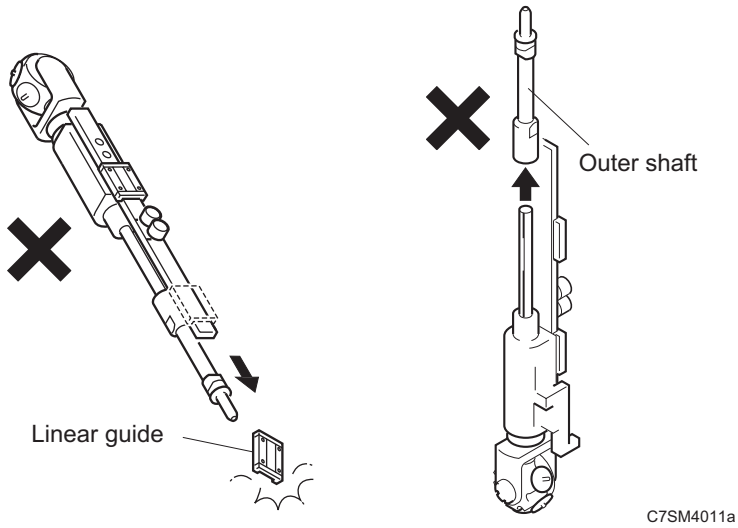
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

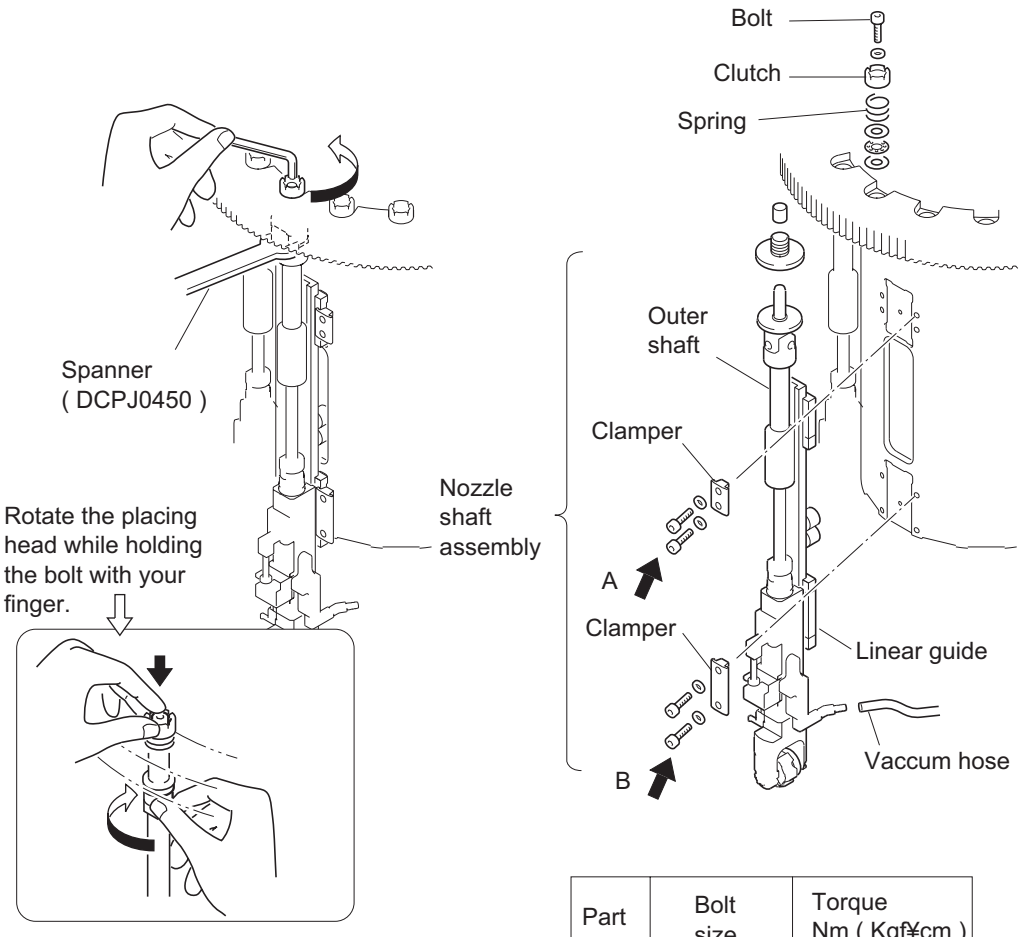
2 In order to remove the nozzle shaft assembly, it is first necessary to remove the upper clutch. Set the cam angle to zero degrees and use a spanner (DCPJ0450) to loosen the bolt on the nozzle shaft moving from ST9 to ST10. Turn the loosened bolt by hand and then remove the clutch. (see next page illustration)

Caution:Remove the nozzle shaft assembly which bears either a "G" or "O" identifier seal. Operations may be complicated if other nozzle shaft assemblies are removed.

3 Remove the linear guide clampers and vacuum hose, then remove the nozzle shaft assembly.

Caution:When handling the nozzle shaft assembly exercise caution to ensure that the linear guide and outer shaft do not become separated.





Caution : Washers may jump when the bolt is loosened because of the spring under the clutch.

Part	Bolt size	Torque Nm (Kgf¥cm)
A	M4	2 (20)
B	M4	2 (20)

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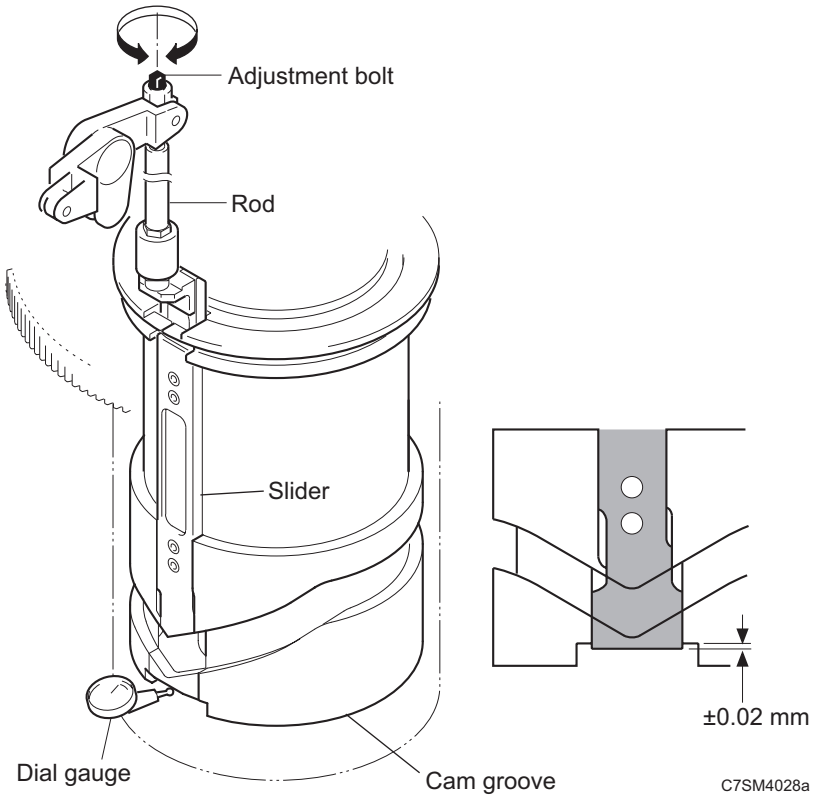
Caution: Do not disassemble the placing head assembly carelessly. Special equipment and skills are required to perform the reassembly of the placing head. Such procedures should be attempted only by users who have attended training at Fuji and are equipped with the necessary tools, or whilst under the direct guidance of a service-man.

4 Move the area for the removed placing head to station 9 (0°), then turn on the solenoid (Y035 ST9 PLACE SOL ENGAGED).

5 Set the cam angle to 0°, and position the dial gauge as shown in the figure below.



6 Adjust the length of the rod using the bolt to ensure that the distance between the base of the slider and the cut out section in the cylindrical cam is within the range of ±0.02 mm.

7 Reattach the placing head assembly in the original location.

Using the clutch alignment jig, reverse the removal procedures to attach the assembly.

Caution:The nozzle shaft assembly is exclusive to the CP-842E/842ME, and cannot be used on other machine types, such as CP-733E, CP-743ME, or CP-743E..

Adjusting the Nozzle UP Limit Sensors

The nozzle UP limit sensor which detects the up limit position of the nozzle UP/DOWN rod at station 9 is mounted inside the cam box. Adjust the mounting position of this sensor so that it switches ON when the nozzle is at its UP limit position.

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

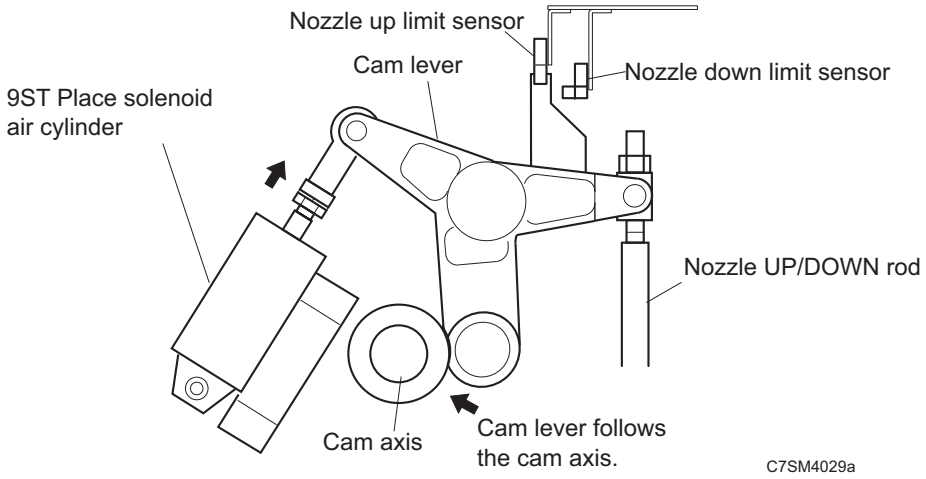
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the cam axis at the 0-degree position.

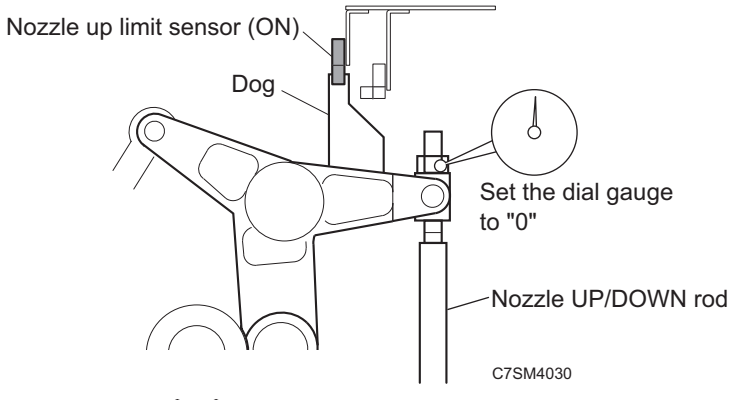
3 Activate the ST9 placing solenoid air cylinder (located in the cam box):

Execute the following I/O commands: [Maintenance] - [I/O Check] - [Standard I/O] - [Y035 ST9 PLACE SOL ENGAGED] - [Output Signal ON]

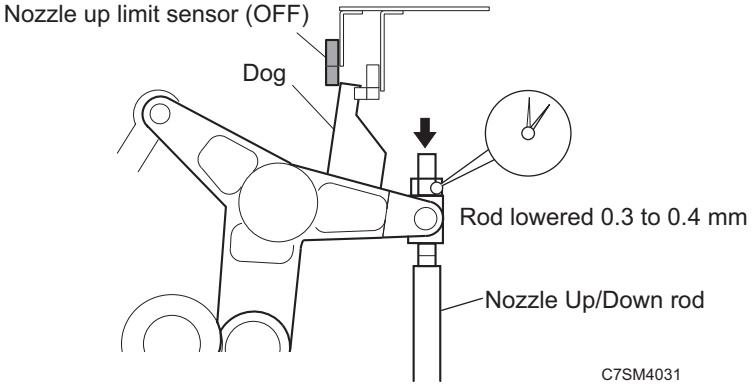
The cam lever will then follow the cam axis.



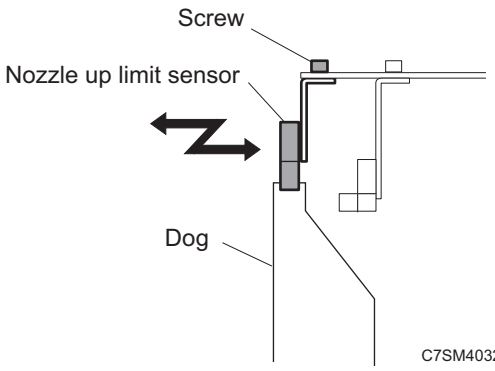
4 Place a dial gauge on the top end of the cam lever and set the gauge reading to "0". In this condition, the cam axis will be at its 0-degree position, and the nozzle UP/DOWN rod will be at its UP limit position. Verify that the nozzle UP limit sensor is ON (X032 ST9 CYLINDER UPPER LIMIT is ON).



5 While observing the dial gauge, rotate the cam axis in the forward direction to lower the nozzle UP/DOWN rod. Adjust the sensor's mounting position so that the sensor switches OFF (X032 ST9 CYLINDER UPPER-LIMIT switches OFF) when the rod has been lowered 0.3 to 0.4 mm.



Adjust the sensor's mounting position by loosening the sensor lock screw and sliding the sensor in the front/back directions.



Adjusting the Nozzle DOWN Limit Sensors

The nozzle DOWN limit sensor which detects the down limit position of the nozzle UP/DOWN rod is mounted inside the cam box. Adjust the mounting position of this sensor so that it switches ON when the nozzle is at its DOWN limit position.

Note: When performing the DOWN limit sensor adjustment after the UP limit sensor adjustment, remove the dial gauge from the machine to avoid interference between the dial gauge and the cam lever.

1 Press the EMERGENCY STOP button to take 200V down to 100V.

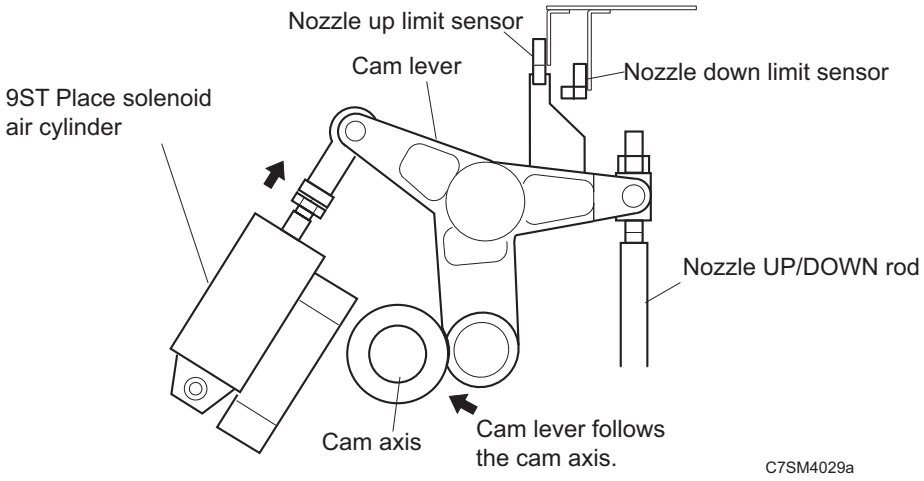
⚠ WARNING

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the cam axis at the 0-degree position.

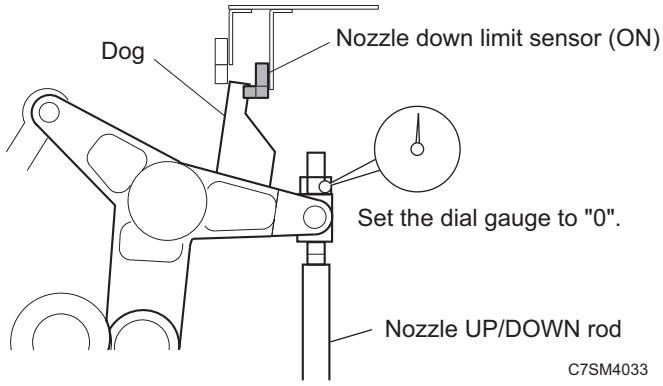
3 Activate the ST9 placing solenoid air cylinder (located in the cam box):

Execute the following I/O commands: [Maintenance] - [I/O Check] - [Standard I/O] - [Y035 ST9 PLACE SOL ENGAGED] - [Output Signal ON]
The cam lever will then follow the cam axis.

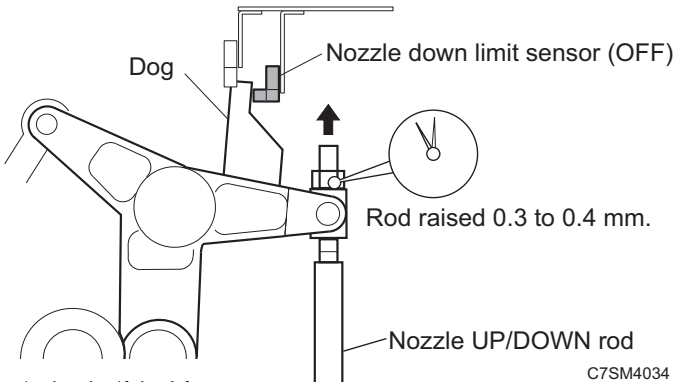


4 Use the cam handle to rotate the cam to 190°.

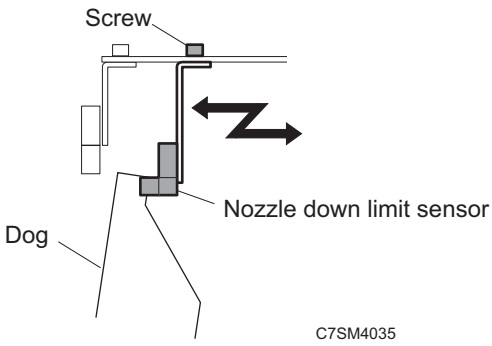
5 Place a dial gauge on the top end of the cam lever and set the gauge reading to "0". In this condition, the nozzle UP/DOWN rod will be at its DOWN limit position. Verify that the nozzle DOWN limit sensor is ON (X033 ST9 CYLINDER LOWER-LIMIT is ON) at the I/O screen.



6 While observing the dial gauge, rotate the cam axis in the forward direction to raise the nozzle UP/DOWN rod. Adjust the sensor's mounting position so that the sensor switches OFF (X033 ST9 CYLINDER LOWER-LIMIT switches OFF) when the rod has been raised 0.3 to 0.4 mm.



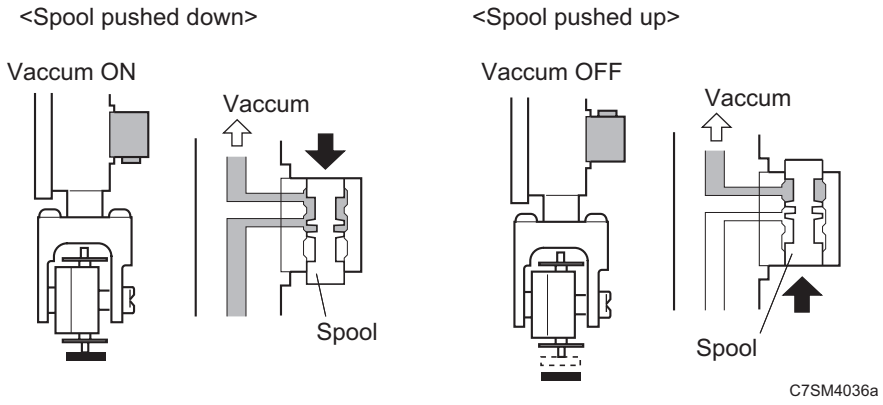
Adjust the sensor's mounting position by loosening the sensor lock screw and sliding the sensor in the front/back directions.



7.1.10 Mechanical Valve Switching (ST9)

Point

The nozzle vacuum goes from ON to OFF with the movement of the mechanical valve at station 9. Vacuum pressure inside the nozzle is released for part placement when the valve closes. Ensure the part is placed on the production board.



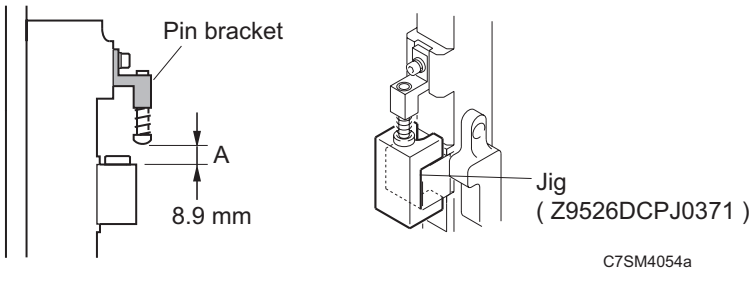
Checking the Position of the Pin Bracket

1 Press the EMERGENCY STOP button to turn off the 200V power, leaving only the 100V power on.

⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

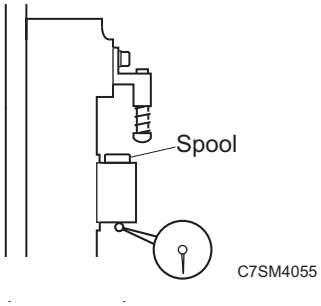
2 Ensure that distance A (as seen in the figure below) is 8.9 mm for all heads. Use a special jig (Z9526DCPJ0371) to check this distance.



Valve Switching Lever Height Adjustment

This adjustment should be performed on the reference head after completing adjustments to the vertical movement of the nozzle. (Refer to 7.1.9 “Nozzle Vertical Movement During Placement” for details.)

The reference head can be identified by its height. All heads are measured with spools lifted, and the lowest one is referred to as the reference head.



1 Press the EMERGENCY STOP button to take the 200V down to 100V.

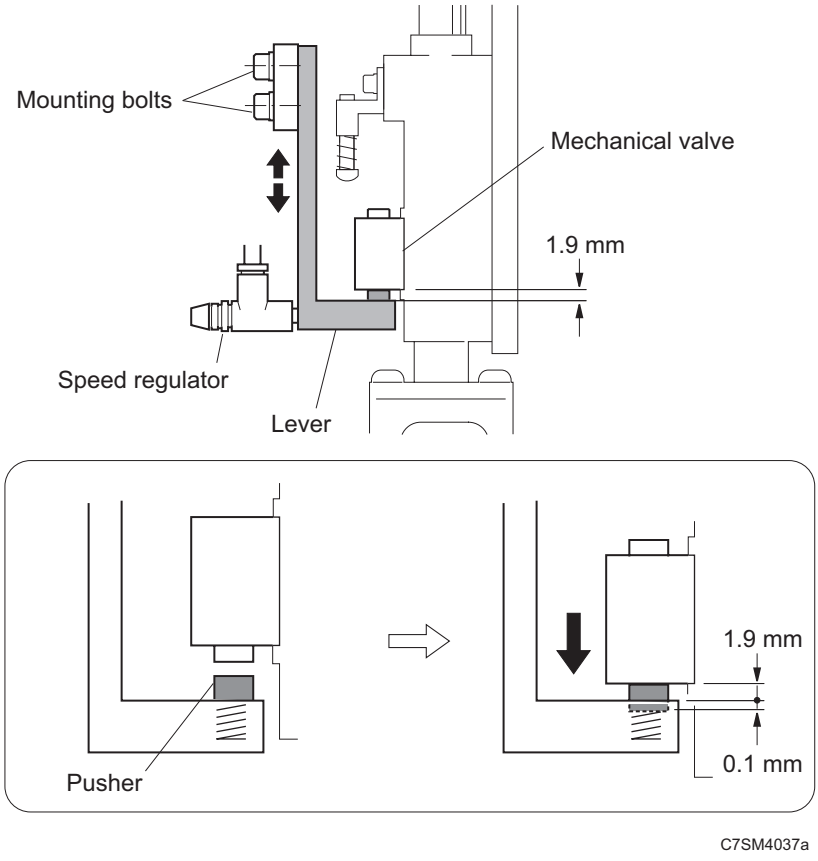
⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the cam angle to 0°, then activate the place solenoid (Y035 ST9 PLACE SOL ENGAGED) at station 9 to work the lever.

3 Use the cam handle to rotate the cam to 190°.

4 Loosen the mounting bolts shown in the figure below, then adjust the lever height until there is a 1.9 mm gap (use a thickness gauge) between the bottom of the mechanical valve and the lever. At this stage, the spring pusher is pressed down 0.1 mm.



Note: Do not touch the speed regulator.
The blow air pressure is set to 15.0 ± 0.5 kPa (ST13: 7.0 ± 0.5 kPa). The user should not change the setting, as a manometer is required for the adjustment.

7.1.11 Reverse-theta Mechanism (ST10)

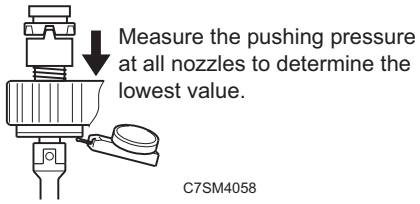
Point

This mechanism reverses the nozzle rotation which occurred at the station 9 part placement. The nozzle is returned from that part placement angle by the amount of rotation which occurred at stations 2 and 8.

Clutch Meshing Check

Perform this check on the low-pressure nozzle.

Note: The low-pressure nozzle refers to the placing head (out of the 16) that receives the weakest pushing pressure. Use the low-pressure nozzle for meshing checks at ST2, 8 and 10.



1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

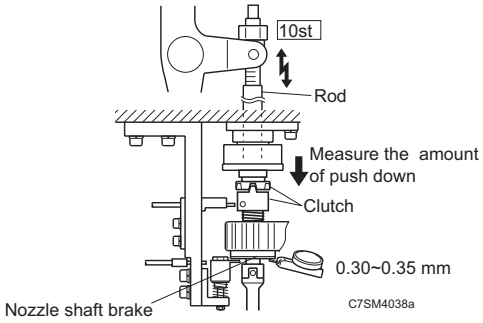
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Set the cam angle to 0 degrees, then turn the ST10 solenoid valve on to work the cam lever.

3 Set the dial gauge to the bottom of the nozzle shaft brake.

4 Use the cam handle to rotate the cam to 200°.

5 Ensure that the clutches mesh properly and the placing head assembly deflects the dial gauge by 0.30 ~ 0.35 mm as illustrated below.



Clutch Meshing Check Sensor Position Adjustment

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

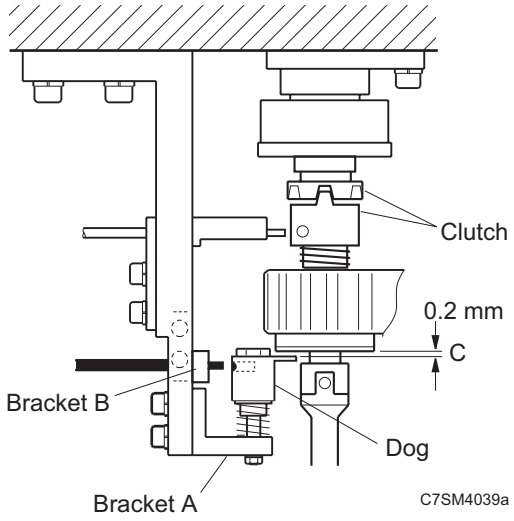
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Use the cam handle to rotate the cam to 200°.

3 Execute inching to align the RQ-axis with the RQ-data position.

4 Make sure the clutches engage properly. Adjust the height of Bracket A so that Gap C in the figure is 0.2 mm.

5 At this position, adjust the position of Bracket B so that the sensor beam hits the hole on the dog.



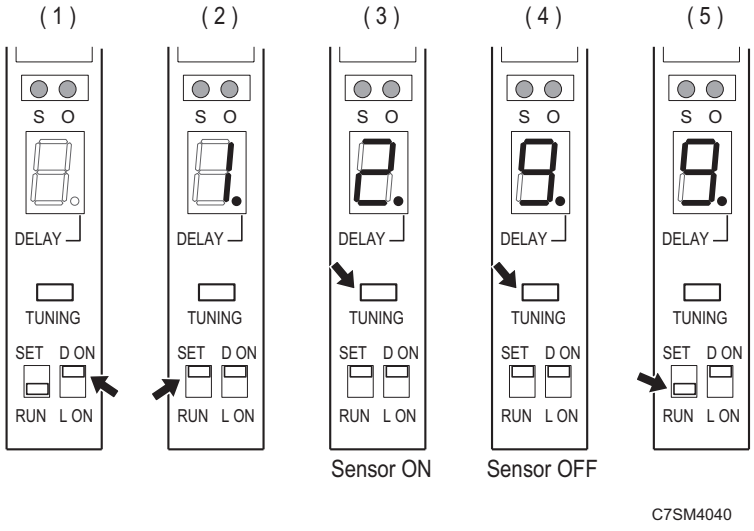
Clutch Meshing Check Sensor Amp Adjustment

Adjust the sensor amp so that it goes off when the clutches mesh properly and it goes on when the clutches do not mesh properly and the dog is pushed down.

Remove the cover of the amp and follow the procedures below.

Note: Be careful not to drop the cover inside the machine.

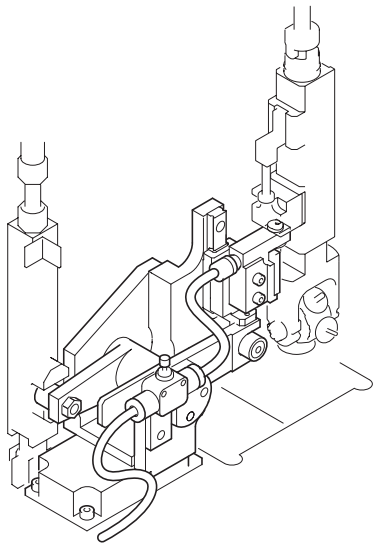
1. Set the setting switch to “D ON”.
2. Set the mode selector switch to “SET”. The digital display will then indicate “1”.
3. With the clutch engagement sensor on (sensor is detecting the hole in the dog), press the [TUNING] button. The digital display will then indicate “2”.
4. With the clutch engagement sensor off (sensor is not detecting the hole in the dog), press the [TUNING] button. The digital display will then indicate “9”.
5. Set the mode selector switch to “RUN”.
6. After completing the amplifier setting procedure, verify that the digital display indicates 0 ~ 1 when the sensor is on, and 8 ~ 9 at all other times.



7.1.12 Mechanical Valve Switching (ST13)

Point

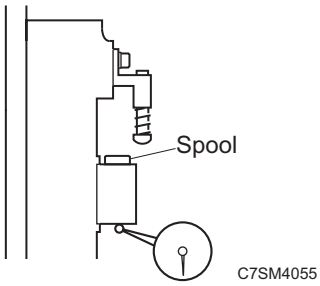
The station 13 mechanical valve is used to switch the vacuum off inside the nozzle. This releases the negative pressure in the nozzle, and the nozzle can no longer hold a part. Verify that parts which fail vision processing are discarded at station 13.



C7SM4041a

Valve Switching Unit Position Adjustment

This adjustment should be performed on the high valve head after completing adjustments to the vertical movement of the nozzle during the placement (Refer to 7.1.9 “Nozzle Vertical Movement During Placement” for details). The high valve head can be identified by its height. The heights of the spool lower surface are measured for all placing heads with spools lifted, and the highest one is referred to as the high valve head.



C7SM4055

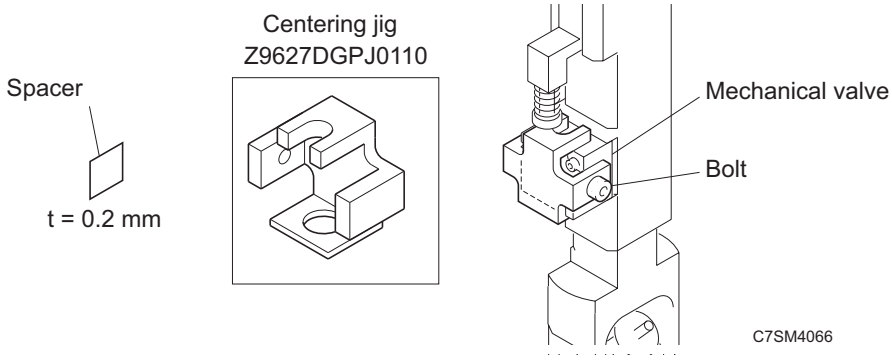
1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ WARNING

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Use an inching operation and move the high valve head to ST12.

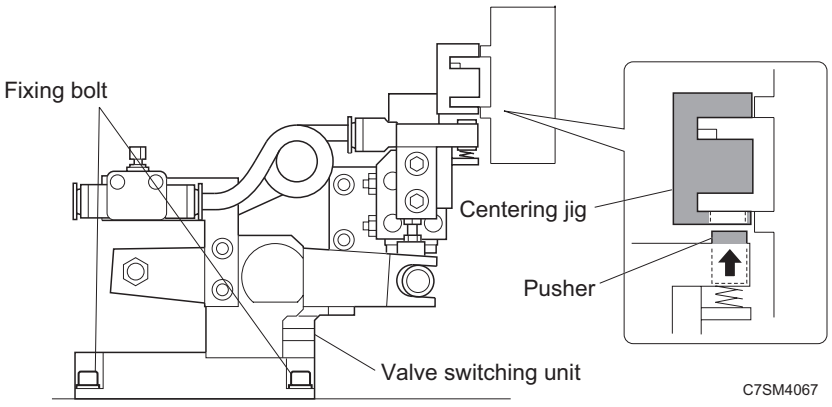
3 Attach the centering jig to the mechanical valve of the high valve head.



Note: Put the 0.2 mm spacer between the fixing bolt and the mechanical valve in order to avoid any scratch to the mechanical valve.

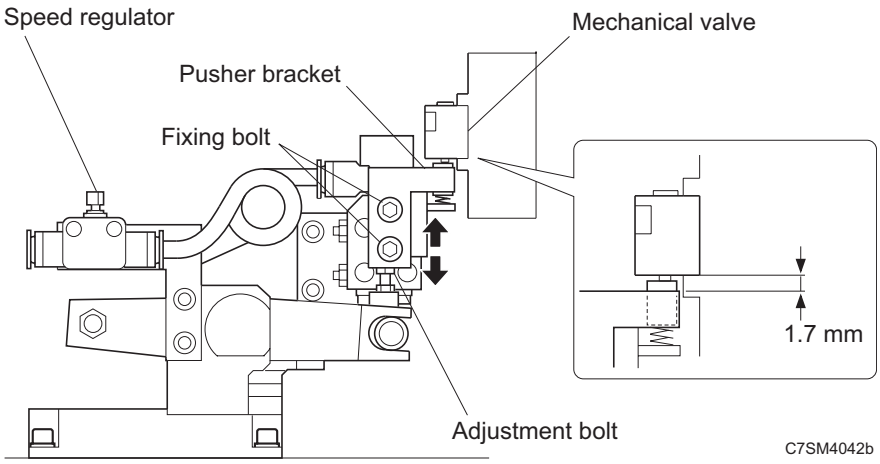
4 Move the high valve head to station 13.

5 Use the cam handle to rotate the cam to the following cam angles:190°
Make sure that the pusher is inserted smoothly to the hole at the bottom of the centering jig. If not, loosen the fixing bolts and adjust the position of the valve switching unit.



6 Return the cam to 0°, and then detach the centering jig from the mechanical valve.

7 Use the cam handle to rotate the cam to the following cam angles:190° Loosen the fixing bolts, then adjust the height of the valve switching unit by turning the height adjustment bolt so that the gap between the bottom of the mechanical valve and the top surface of the pusher bracket becomes 1.7 mm



Note: Do not touch the speed regulator.
The blow air pressure is set to 7.0 ± 0.5 kPa (ST9: 15.0 ± 0.5 kPa). The user should not change the setting, as a manometer is required for the adjustment.

7.1.13 Nozzle Change Function (ST14)

Point

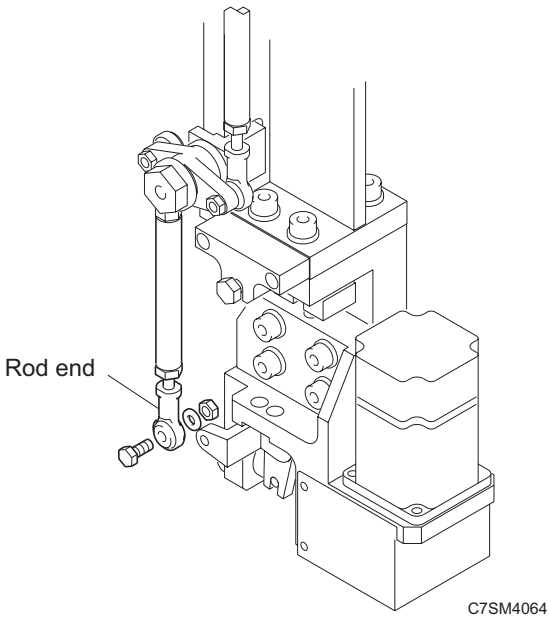
The station 14 nozzle changer selects from among nozzle numbers 1-6, based on the part data.

Nozzle Change Clutch Position Adjustment

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

> ⚠ ***WARNING***
>
> - ***Always be sure to cut off the 200V power before carrying out any work.***
> - ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Detach the rod end from the nozzle changer.

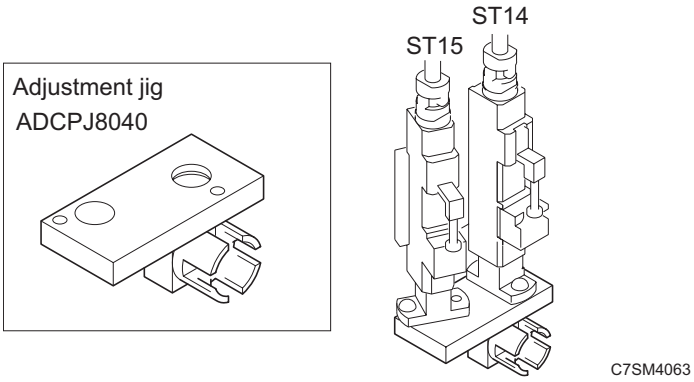


3 Remove the nozzle holders of the reference head and the neighboring heads.

4 Use an inching operation and move the reference head to ST14.

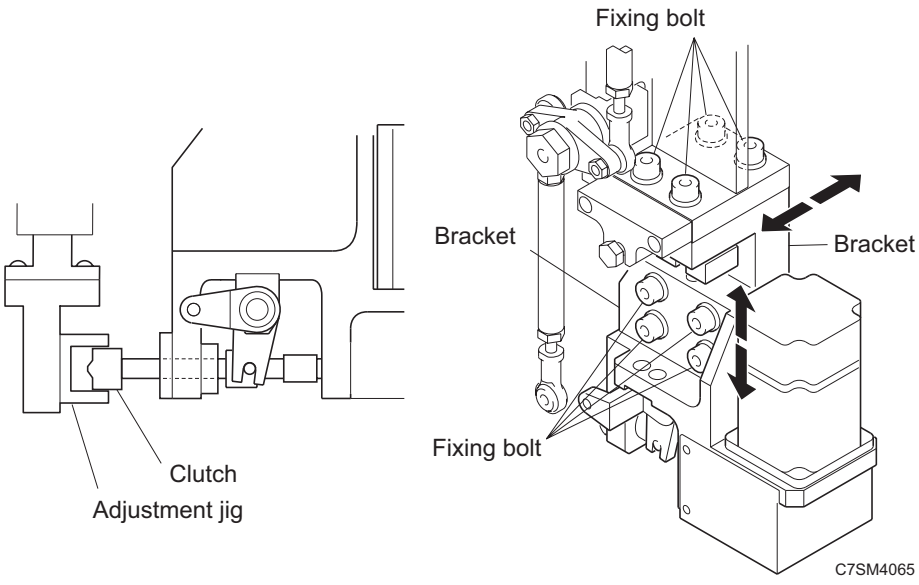
5 Use the cam handle to rotate the cam to 200°.

6 Attach the adjustment jig to the placing heads at ST14 and 15.



Note: Do not turn the cam with the jig attached to the placing heads; otherwise the heads might be damaged.

7 Loosen the fixing bolts and adjust the clutch position so that it can be smoothly inserted to the cavity of the jig block.



Nozzle Change Stroke Adjustment

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

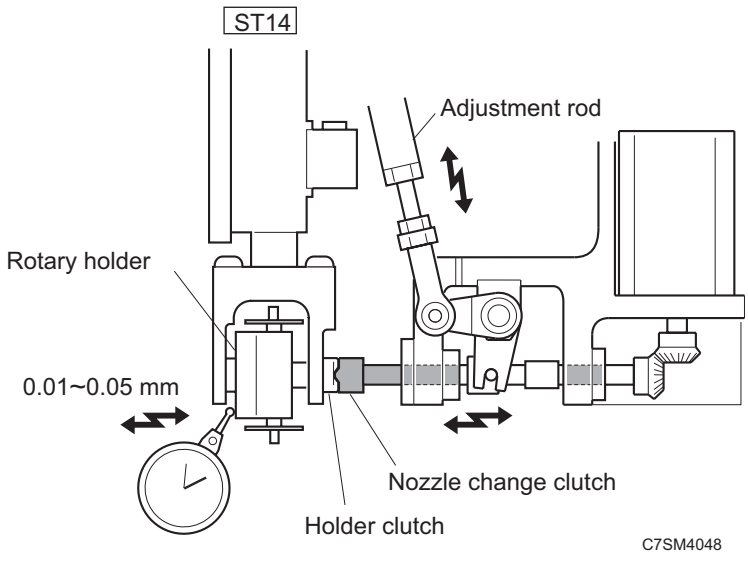
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Position the cam at an angle of 0° and turn the ST14 solenoid to ON (Y037 ST14 NOZZLE CHANGE SOL ENGAGED) to activate the cam lever.

3 Use the cam handle to rotate the cam to 141°.

4 Verify that the nozzle change clutch is engaged with the holder clutch, and that the rotary holder is pushed 0.01 to 0.05 mm as shown in the figure below.

5 If the push amount is outside this range, adjust by turning the adjusting rod.

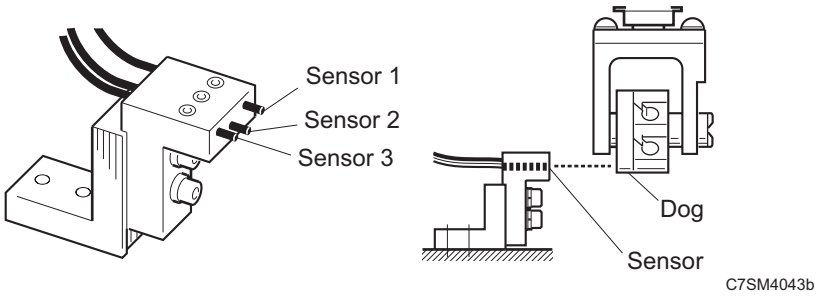


7.1.14 Nozzle Detection Sensor (ST15)

Point

Station 15 uses three nozzle detection sensors to detect which of the six nozzles (No. 1 ~ 6) is pointing straight down.

The following illustration shows the location of each sensor.



Sensor Position Adjustment

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

⚠ *WARNING*

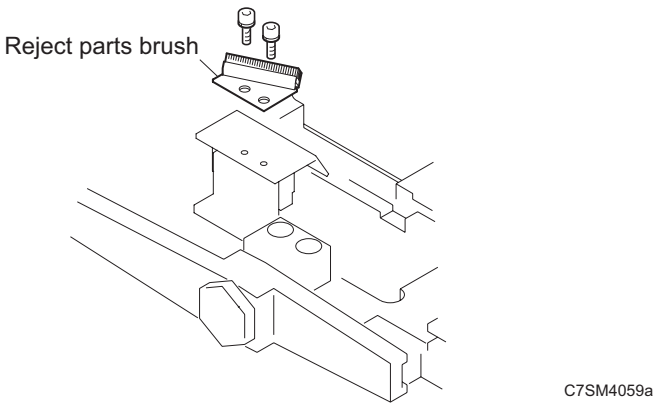
- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Remove the nozzle holders of the reference head and the neighboring heads.

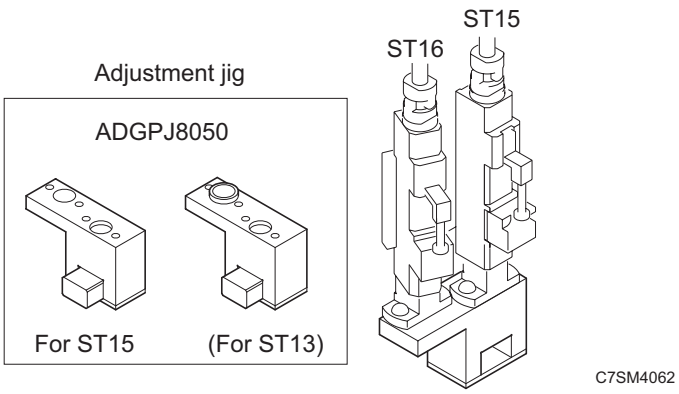
3 Use an inching operation and move the reference head to ST13.

4 Use the cam handle to rotate the cam to 200°.

5 Detach the reject parts brush.

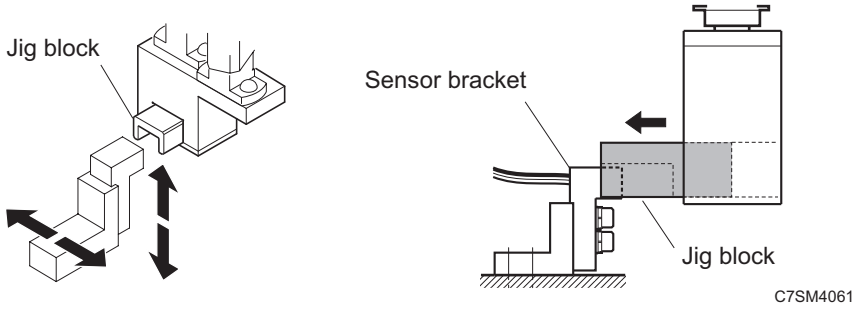


6 Attach the adjustment jig (for ST15) to the placing heads at ST15 and 16.



Note: Do not turn the cam with the jig attached to the placing heads; otherwise the heads might be damaged.

7 Adjust the sensor bracket position so that it can be smoothly inserted to the cavity of the jig block.



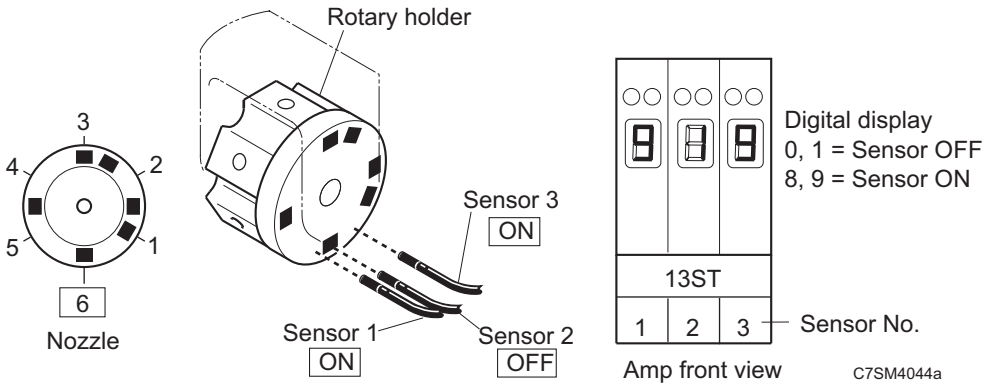
Checking the Sensor Reaction

1 Press the EMERGENCY STOP button to take the 200V down to 100V.

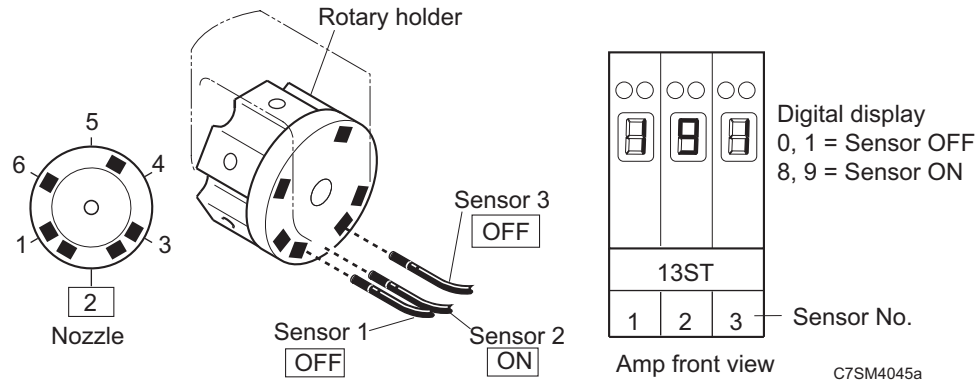
⚠ *WARNING*

- ***Always be sure to cut off the 200V power before carrying out any work.***
- ***Exercise extreme caution when working on the machine if the cam is not at its origin (0 deg.). Recoil of the cam axis can endanger the operator.***

2 Manually rotate the rotary holder to select nozzle No. 6. At this time, the sensor reactions should be the same as shown below.



3 Rotate the rotary holder to select nozzle No. 2. At this time, the sensor reactions should be the same as shown below.



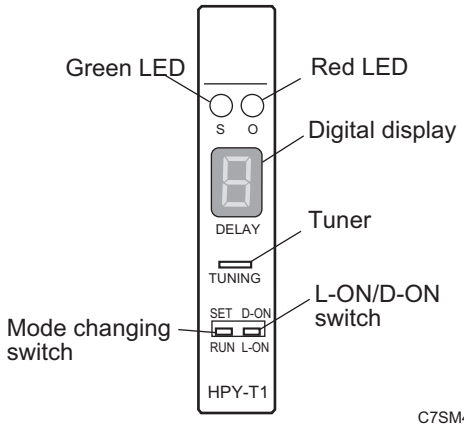
4 Ensure that the sensors display for the other nozzles as shown below.

	Sensor 1	Sensor 2	Sensor 3
Nozzle 1	ON	OFF	OFF
Nozzle 2	OFF	ON	OFF
Nozzle 3	OFF	OFF	ON
Nozzle 4	ON	ON	OFF
Nozzle 5	OFF	ON	ON
Nozzle 6	ON	OFF	ON

Digital display
0,1 = Sensor OFF
8,9 = Sensor ON

T001

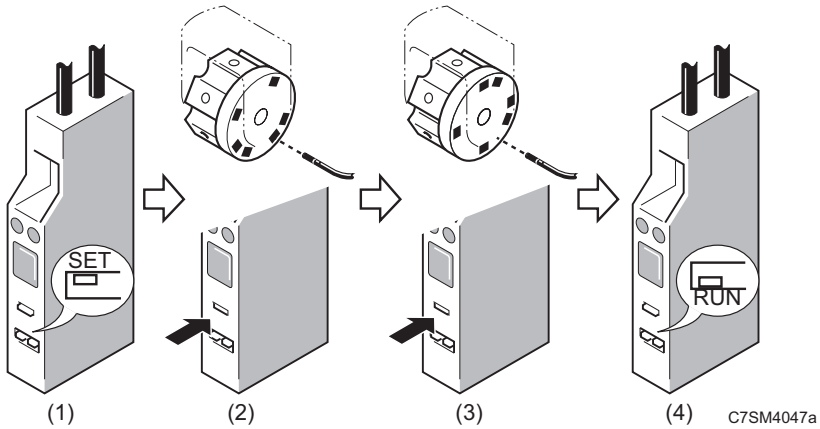
Sensor Sensitivity Adjustment



Remove the cover of the amp and follow the procedures below to adjust the sensor amp.

Note: Be careful not to drop the cover inside the machine.

Set the L-ON/D-ON switch to L-ON for the nozzle detection sensor.



1 Move the amplifier's mode change switch to the "SET" position.

2 Rotate the nozzle holder until the sensor light beam is adjacent to a dark part of the dog and press "TUNING".

3 Rotate the nozzle holder until the sensor light beam is adjacent to a metal part of the dog and press "TUNING".

4 Return the amplifier's mode changing switch to the "RUN" position.

At this time the sensitivity of the sensor can be checked on the digital display.

Digital display :

0 ~ 1: Stable interruption range
8 ~ 9: Stable light input range
If the display is within the stable range, setting is complete.

5 If the display is not within the stable range, check the items below and make the necessary adjustments.

- Check the connections between the amplifier and the fiber optic cable.
- Check the position of the sensor.

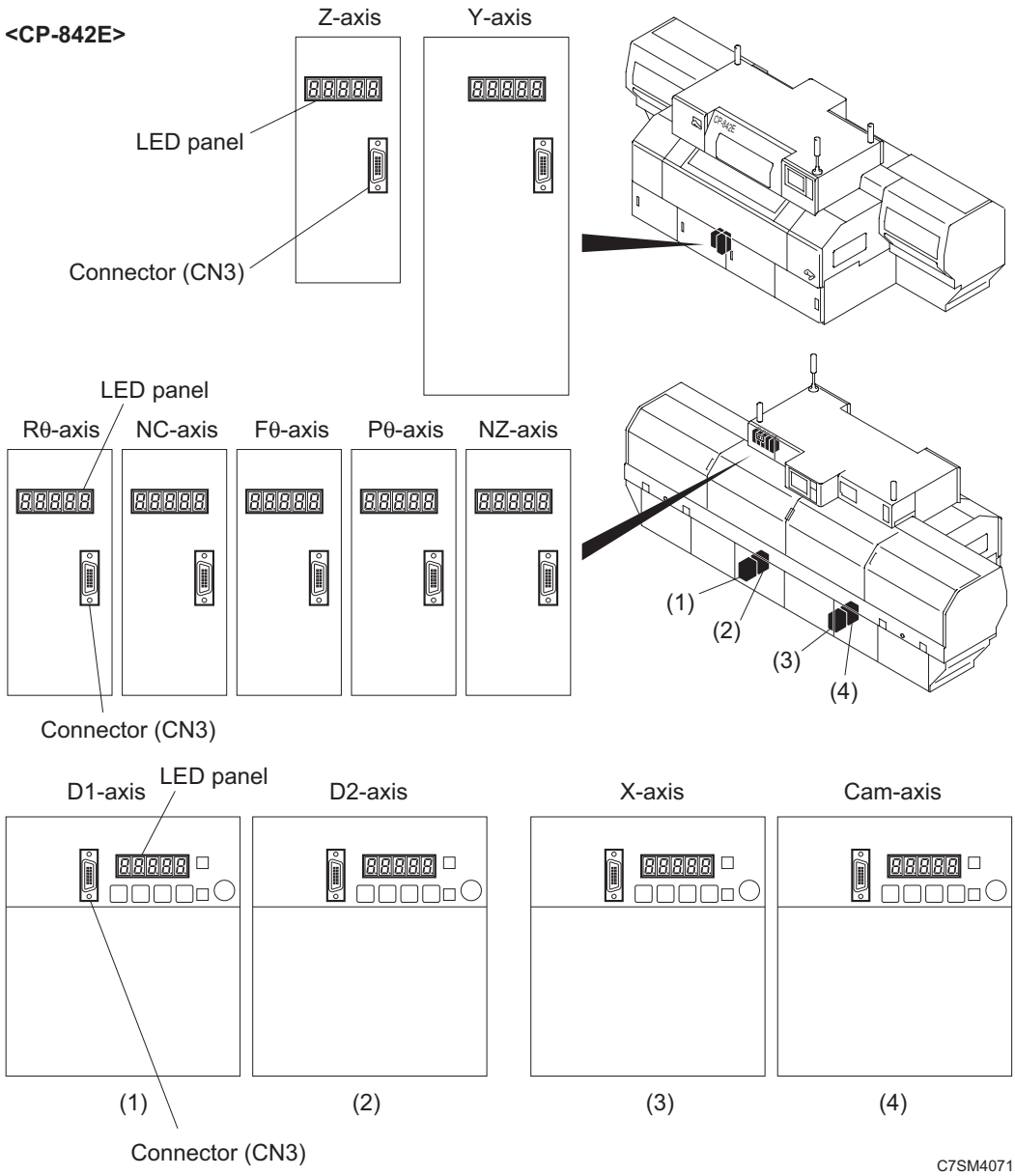
7.2 Servo Amplifier Adjustments

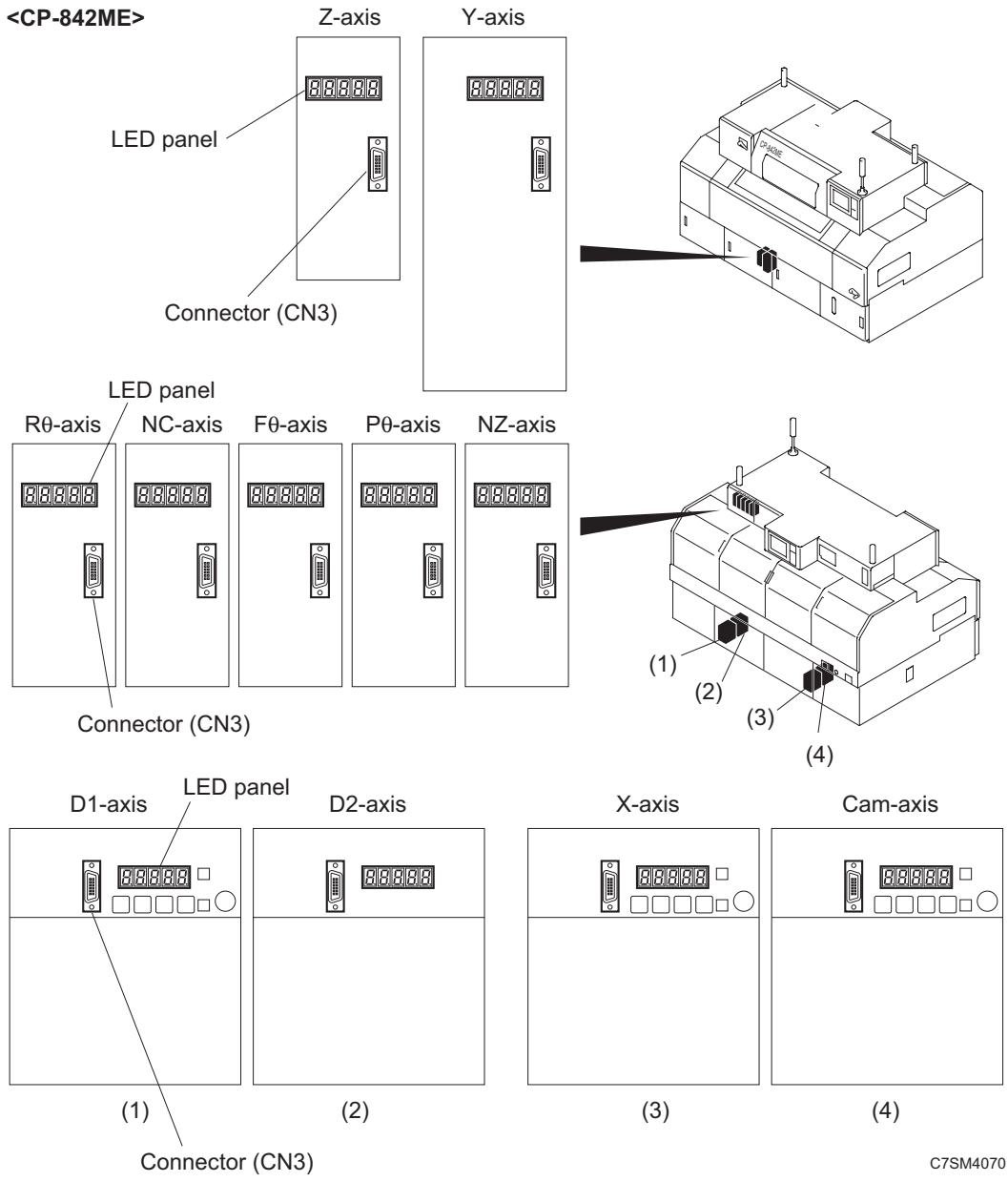
Required Tools

Required Tools:1 Digital Operator

7.2.1 Servo amplifier parameters

1 Connect the Digital Operator cable to the servo amplifier to be adjusted (CN-3 connector).



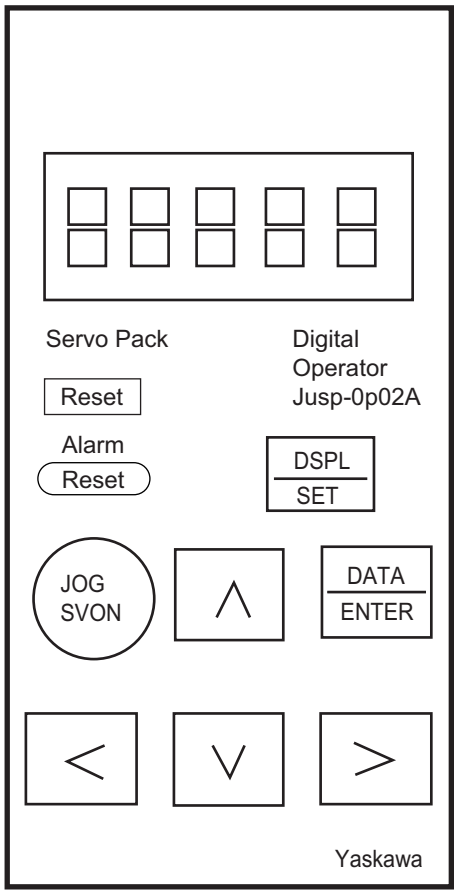

<CP-842ME>
Z-axis
Y-axis
LED panel
Connector (CN3)
LED panel
Rθ-axis
NC-axis
Fθ-axis
Pθ-axis
NZ-axis
Connector (CN3)
(1)
(2)
(3)
(4)
D1-axis
LED panel
D2-axis
X-axis
Cam-axis
(1)
(2)
(3)
(4)
Connector (CN3)
C7SM4070

2 Press the [DSPL/SET] button on the Digital Operator until “PN-00” is displayed by the LED indicator.

3 The parameter type can be changed by pressing the Up or Down arrow key.

4 When the desired parameter is displayed, press the [DATA/ENTER] button and check the current setting.

Note: Contact Fuji if any of the displayed parameters differ from those indicated in the servo parameter sheet. Do not change the parameter settings unless otherwise instructed.



QP3M4008Ea

5 After confirming the parameter setting, press the [DSPL/SET] button to return to the “PN-XX” display. Repeat steps 3 to 5 to check all the parameters.

7.2.2 Resetting servo errors

Servo errors that cannot be reset using commands at the machine can be reset by connecting the digital operator to the applicable servo amplifier and pressing the [Alarm Reset] button.

Servo alarm codes

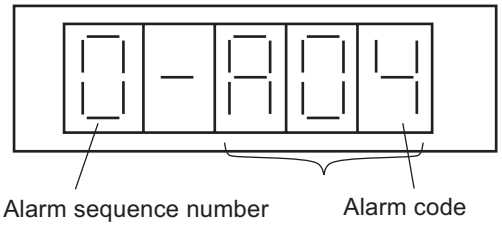
When a servo amplifier error occurs, you can view the alarm code by connecting the digital operator to the applicable amplifier. For further details regarding alarm codes, see Chapter 2 “2.2. Alarm Codes and Troubleshooting Check List.”

Servo alarm code history

It is possible to view previous alarm codes, either by using the digital operator or by using the indicator panel on the servo amplifier, as follows.

Using the digital operator

1. Connect the Digital Operator cable to the applicable servo amplifier (CN-3 connector).
2. Press [DSPL/SET]- [DATA ENTER] to display the alarm code at the LED indicator.



The alarm sequence number is displayed in ascending order, starting with the most recent alarm code

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3. It is possible to scroll through the alarm sequences by pressing the Up or Down arrow key.

Using the indicator panel on the servo amplifier

1. Press the [MODE/SET] button, and then press and hold the [DATA/SHIFT] button for at least one second to display previous alarm codes.
2. It is possible to scroll through the alarm sequences by pressing the Up or Down arrow key. (The alarm sequence number (at the left side of the code) is displayed in ascending order, starting with the most recent alarm code.)

8. Troubleshooting

8.1 Troubleshooting Table

Point

This chapter describes troubleshooting measures for problems which may occur during production.

Separate troubleshooting tables are provided for each type of problem. When a problem occurs, begin by identifying the appropriate table for the problem in question, then refer to the "Cause" column of that table to find the problem cause. After locating the cause, refer to the "Remedy" and "Remarks" columns to the right of that item for details regarding appropriate corrective actions. The "Ref. Page" column at the far right of the table indicates reference material (manuals, etc.) chapter numbers where information is given regarding the procedure in question.

The following alphabetic codes are used in the "Ref. Page" column to indicate the various reference materials:

M: CP-842E/842ME Mechanical Reference (MEC-CP842-Preliminary)

S: CP-842E/842ME System Reference (SYS-CP842-Preliminary)

T: FujiCam Tutorial Manual (EKEN301*)

U: F4G User's Manual (ELEN013*)

FM: CP Feeders Mechanical Reference (MEC-CPFDR-*.*E)

FJ: CP Tape Feeder Jig Instruction Manual (INS-CPFJG-*.*E)

SG: Feeder Setup Guide (GDE-FEEDER-*.*E)

PG: WC Feeder Pickup Position Adjustment Guide (GDE-PKUPT-*.*E)

8.1.1 Poor Placing Accuracy

No.	Cause	Remedy	Remarks	Ref. Page
1-1	Setting error in Part data.	Specify the appropriate nozzle size and cam speed settings using the Tech Report issued by Fuji as a reference.	Unsuitable nozzle size, part weight, and cam speed, etc., settings can result in an insufficient holding force when handling parts, causing nozzle and part slippage. The Fuji Tech Report is meant for reference purposes only. The recommended cam speed may be different even if the part shap is the same.	T: Part 3, Lesson 2 "2.1.3" U: Part 2 Chapt 4 "Nozzle" "Speed"
		If accuracy deviations or defects are occurring for a specific part, decrease the XY table speed setting in the Part data where the problem is occurring.	An unsuitable XY table speed can apply a force which exceeds the holding capacity of the part's solder, resulting in position deviations. Solder adhesion decreases when it dries. Therefore, the sooner placement occurs after printing, the better.	T: Part 3 Lesson 2 "2.1.3" U: Part 2 Chapt 4 "Speed"
		Check for errors in the part height information.	"Missing parts" conditions may occur if there is an error in the part height information, or in the table reference height Proper data. Fuji recommends actually measuring the part height, and entering the measured value in Part data.	T: Part 3 Lesson 2 "2.1.1" U: Part 2 Chapt 4 "Appearance"
1-2	Defective nozzle	(1) Use the nozzle check command to check for bent nozzles. (2) Verify that the nozzle spring-back motion is smooth. (3) Verify that the nozzle is not clogged. If a problem is found with any of the above, replace the nozzle.	A bent or stuck nozzle will make it impossible to place parts properly.	M: Sect 6.1
1-3	Improper placement height	Check the backup pin heights, quantity, and configuration, and verify that the panel is flat.	A misalignment between the ST9 nozzle down limit and the panel height can prevent the part from being pressed onto the board properly, and it may become impossible to maintain accuracy.	M: Sect 4.1
		Check for a problem with the Proper data Z0 (0.3 mm push in).	Note: Machine adjustments can be performed only by those with a Level 3 training.	
		Check for the reference and followup rails' flatness problem.	Note: Machine adjustments can be performed only by those with a Level 3 training.	
1-4	Vacuum break problem	Replace mechanical valves where the spool motion is not smooth.	A malfunctioning vacuum break may affect placing accuracy.	M:Sect 7.1.4
		Adjust the vacuum break lever position and the speed controller.		
1-5	Problem after machine status change.	Verify that the machine base is level (if not, level it).	Failure to level the machine base after the machine has been moved, etc., can affect the XY-table flatness, making the current Prope data settings unsuitable.	M:Sect 9.1
		Measure the X0/Y0 and camera resolution.	Note: Machine adjustments can be performed only by those with a Level 3 training.	
		Perform a calibration using a PAM part.		
1-6	Printing conditions problems.	Check the solder condition after printing.	The solder printing condition or dryness can cause part deviations during board conveyance, or can affect the self-alignment at reflow operations. Solder adhesion weakens when the solder dries. Therefore, the sooner placement occurs after printing, the better.	
1-7	Reflow conditions problems.	Check the reflow temperature profile.	Improper reflow conditions can cause self-alignments and tombstoning. Provide a profile in which the temperature is increased evenly over the entire board. If the solder's melting speed differs from point to point, parts will be pulled toward the solder which melts first.	

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8.1.2 Pickup Errors

No.	Cause	Remedy	Remarks	Ref. Page
2-1	Feeder top-film does is not taken up correctly.	Set the top film correctly.	Take-up will be abnormal if the top film is not set correctly.	FM: Part 2 Chapt 1 FM: Supplement
		The top-film is not being peeled off at the pickup point. Peel off the top-film and verify that the take-up roller and reel are set correctly.	(Point) The top-film is not being peeled off at the pickup point. Peel off the top-film and verify that the take-up roller and reel are set correctly.	FM: Part 2 Chapt 1
		Clean the tape leaf slit.	A clogged tape leaf slit can back up the top-film and prevent proper take-up.	FM: Part 3 Chapt 2 "2.2"
		Clean the inside of the take-up roller.	Take-up resistance increases if the take-up roller fails to rotate smoothly.	FM: Part 3 Chapt 2 "2.4"
		If the take-up spring is deformed, replace it.	A deformed take-up spring reduces the take-up force.	FM: Supplement "Replacement"
		Check the take-up reel's reverse-direction torque. If clearly low, replace the take-up reel.	An excessively low reverse-direction torque will reduce the take-up force.	FM: Part 3 Chapt 4 "4.8"
		If the take-up reel or aluminum bracket is deformed, replace it.	Damage may occur or take-up may not be correct if the take-up reel or aluminum bracket is bent. This may also interfere with surrounding feeders.	FM: Part 3 Chapt 5 "5.5", "5.7"
2-2	Feeder set improperly	1. Check the tape and feeder feed pitches, and set the tape on the correct feeder. 2. Use a tape leaf which is suitable for the nozzle.	1.An incorrect tape and feeder width or feed pitch will prevent parts from being fed to the proper position. 2.A tape leaf which is unsuitable for the nozzle size will cause parts to spring off the tape.	FM: Part 2 Chapt 2
		Set the tape leaf lock securely.	An incorrectly set tape leaf lock will cause the tape leaf to lift, resulting in part tombstoning and parts springing off the tape.	FM: Part 2 Chapt 5 "5.2"
		Clean away parts and dust, etc., which have adhered to the tape leaf.	Parts and dust, etc., adhering to the inside of the tape leaf will prevent the tape from being pressed properly. Air-blow the tape leaf before setting a tape.	FM: Part 3 Chapt 2 "2.2"
		Replace the tape leaf if it is deformed or if it is not flat.	A deformed tape leaf will cause part tombstoning and parts springing off the tape.	FM: Part 3 Chapt 5 "5.1"
2-3	Improper feeder tape feed.	Set the tape correctly.	Tape feed resistance increases if the tape is not set properly in the feeder.	FM: Part 2 Chapt 1
		Clean away parts which are embedded in the sprocket and stopper.	Parts which are embedded in the sprocket and stopper can prevent tape feed.	FM: Part 3 Chapt 2 "2.1"
		1) Check the feed lever height and the feed movement. 2) When link assembly is deformed replace any deformed parts.	An incorrect feed lever height will prevent a proper tapefeed stroke, and may disable tape feed.	FM: Part 3 Chapt 4 "4.9" Chapt 5 "5.3"
		Replace the reel holder if it is bent.	The parts reel will not rotate correctly if the reel holder is bent.	

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No.	Cause	Remedy	Remarks	Ref. Page
2-4	Deviation between the feeder and machine pickup position.	Check the pickup offset (X,Z) setting in Part data.		T: Part 3 Lesson 2 "2.1.3" U: Part 2 Chapt 4 "Carrying"
		Clean away parts and dust, etc., which have adhered to the device table and feeder tape leaf.	The presence of parts or foreign matter, etc., on the device table or on the feeder's L-guide can prevent the feeder from being set in the correct position.	FM: Part 3 Chapt 2 "2.3"
		Clean away parts and dust, etc., which have adhered to the ratchet.	Parts which have adhered to the ratchet can cause pickup position deviations at regular intervals. Air-blow the ratchet area before etting the tape.	FM: Part 3 Chapt 2 "2.1"
		Use a grinder to flatten the gouges in the feeder's L-guide.	Gouges in the feeder's L-guide can prevent the feeder from being set in the correct position.	FM: Part 3 Chapt 7
		Adjust the pickup position.	Pickup position deviations may occur after prolonged feeder use. Check the pickup posiiton periodically. Lubricate the ratchet area. Failure to lubricate can result in ratchet and stopper wear which will cause pickup position deviations.	DT-651(E) Digitizer with Image Processing Instruction Manual FM: Part 3 Chapt 4 "4.9" FM: Part 3 Chapt 4 "4.11"
		Adjust the ST1 pickup height.		M:Sect7.1.3
		Measure the part height sensor's nozzle height reference value.	An unsuitable reference value will result in an automatic offset of the pickup height. Note: Machine adjustments can be performed only by those with a Level 3 training.	
2-5	Defective nozzle.	1) Use the nozzle check command to check for bent nozzles. 2) Verify that the nozzle spring-back motion is smooth. 3) Verify that the nozzle is not clogged. If a problem is found with any of the above, replace the nozzle.	· A bent nozzle will cause pickup position deviations, and may prevent pickup from occurring properly. · A stuck nozzle cannot reach the part, making pickup impossible. · A clogged nozzle will have a lower vacuum force, and may prevent pickup from occurring properly.	M:Sect 6.1
2-6	Vacuum force is too low.	Ensure that the pressure value on the vacuum pump displays at most -40kPa. Replace the pump parts if the value fails to reach the prescribed range.	A low vacuum force may prevent parts from being pick up properly.	M:Sect 6.7
		Replace mechanical valves where the spool motion is not smooth.	Poor spool motion can prevent parts from being picked up properly.	M:Sect 7.1.4
		Check the connection of the hose between the vacuum pump and the index unit.	Cracks in hoses can prevent parts from being picked up properly.	M:Sect 6.9
		Check the hose between the vacuum pump and the index unit.		
2-7	The ST1 feeder's feed lever has been tripped.	Reset the ST1 feeder's feed lever.		

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8.1.3 Vision Processing Errors

No.	Cause	Remedy	Remarks	Ref. Page
3-1	Part size is different from Part Data setting value.	Replace the error part with the correct part type.	This error occurs because the part information set in Part data is different from the part on the machine.	
		Enter the correct (error part's) part size, part height, lead pitch, etc., settings in Part data.		T: Part 3 Lesson 2 "2.1.1", "2.1.2" U: Part 2 Chapt 4 "Appearance", "[Element] window"
3-2	Nozzle is soiled.	Check production information to see if a specific nozzle is causing the vision processing errors. If so, clean/replace that nozzle, or replace its reflective seal.	If the problem is being caused by a soiled nozzle, the vision processing error will occur only when that soiled nozzle is used.	M:Sect 5.1.4 :Sect 6.1 :Sect 6.2
	Prism box surface is soiled.	Check for dust, etc., around the displayed image of the part causing the vision processing error, the wipe the prism box surface clean with a dry cloth or cotton swab.	If the prism box surface is soiled, vision processing errors will occur for almost all parts.	M:Sect 5.1.5
	The part size is slightly different from the Part data setting.	Measure the size of the part where frequent errors are occurring, then enter this correct size in Part data.	Frequent vision processing errors may be caused by slight differences between the actual part dimensions and the dimension settings. In such cases, measure the actual part, and enter those dimensions as the settings.	T: Part 3 Lesson 2 "2.1.1" U: Part 2 Chapt 4 "Appearance"
3-3	Parts are not being picked up.	Refer to item 2 (Pickup Errors).		

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8.1.4 Panel Conveyance Related Errors

· Most panel conveyance errors are caused by sensor problems. As a rule, these errors occur due to one of the following 6 causes. After checking the machine's error display content, check the following items at the sensor in question.
(1) Panel detection problem.
(2) Sensor beam emitter is aimed at a notched area of the panel.
(3) Sensor beam emitter is soiled (foreign matter is present).
(4) Sensor has failed.
(5) Disconnected/severed cable, etc.
(6) I/O board and I/O terminal board malfunction.

· As a malfunctioning actuator may be responsible for problems with sensors which detect the cylinder actuator stroke end, etc., item (7) shown below should also be checked.
(7) Sensor detection problem caused by malfunctioning cylinder, etc.

No.	Cause	Remedy	Remarks	Ref. Page
4-1	In-carrier panel conveyance error	(1) Check whether the panel is being clamped correctly. (2) Check the following sensors for problems (1) - (6) (described above). In-carrier advance limit panel check (1) XOB1	XOB1 or XOB2 panel sensor fails to switch on at carrier advance limit even though a panel has been loaded from the in-lifter. Or, panel has been conveyed from the in-carrier to the XY-table, but the X0B1 or XOB2 panel sensor fails to switch off.	M:Sect 3.3
4-2	In-carrier advance limit error	(1) Check the following sensor for problems (3) - (6) (see above). In-carrier advance limit check XOB3	In-carrier was advanced, but the in-carrier advance limit sensor failed to switch on.	M:Sect 3.3
		(2) Check the in-carrier conveyance cylinder for problem (7) (see above). Execute the following commands to see if the carrier can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[In-side]-[Carrier Extend/Carrier Retract]-[START].	In-carrier may not be moving all the way to its motion limit position.	S:Sect 3.1
4-3	In-carrier cycle error	(1) Check the following sensor for problems (3) - (6) (see above). In-carrier advance limit check XOB3 In-carrier retract limit check XOB4	In-carrier was conveyed, but the in-carrier advance limit or retract limit sensor failed to switch on. An in-carrier cycle error occurs if the advance limit or retract limit sensor fails to switch on within 8 seconds.	M:Sect 3.3
		(2) Check the in-carrier conveyance cylinder for problem (7) (see above). Execute the following commands to see if the carrier can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[In-side]-[Carrier Extend/Carrier Retract]-[START].	In-carrier may not be moving all the way to its motion limit position.	S:Sect 3.1
4-4	In-carrier clamping error	(1) Check the following sensor for problems (3) - (6) (see above). In-carrier retract limit panel clamp check (fixed-rail side) X0B7 In-carrier retract limit panel clamp check (adjustable-rail side) X0B8 In-carrier advance limit panel clamp check (fixed-rail side) X0B9 In-carrier advance limit panel clamp check (adjustable-rail side) X0BA In-carrier retract limit panel unclamp check (fixed-rail side) X0BB In-carrier retract limit panel unclamp check (adjustable rail side) X0BC In-carrier advance limit panel unclamp check (fixed-rail side) X0BD In-carrier advance limit panel unclamp check (adjustable-rail side) X0BA	· In-carrier clamper was closed but the clamp sensor failed to switch on. · In-carrier clamper was opened but the unclamp sensor failed to switch on.	M:Sect 3.3
		(2) Check the in-carrier clamping/unclamping cylinder for problem (7) (see above.) Execute the following commands to see if the carrier can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[In-side]-[Carrier Extend/Carrier Retract]-[START].	The clamper may not be closing/opening all the way to its limit position.	S:Sect 3.1

* The "X???" and "Y???" values which appear in the remedy column correspond to the I/O map assignment numbers.

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No.	Cause	Remedy	Remarks	Ref. Page
4-5	Out-conveyor panel conveyance error	(1) Verify that the carrier has properly clamped the panel. (2) Check the following sensors for problems (1) - (6) (described above). Out-carrier advance limit panel check (1) X0CC Out-conveyor 1 panel arrival check X0C7	Panel sensor or panel arrival sensor fails to switch on even though a panel has been received from the XY-table.	M:Sect 3.3
4-6	Out-carrier advance limit error	(1) Check the following sensor for problems (3) - (6) (see above). Out-carrier advance limit check X0CE	Out-carrier advance limit sensor failed to switch on even though the out-carrier was advanced.	M:Sect 3.3
		(2) Check the in-carrier conveyance cylinder for problem (7) (see above). Execute the following commands to see if the carrier can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[Out-side] -[Carrier Extend/Carrier Retract]-[START].	Carrier may not be moving all the way to its motion limit position.	S:Sect 3.1
4-7	Out-carrier cycle error	(1) Check the following sensors for problems (3) - (6) (see above). Out-carrier advance limit check X0CE Out-carrier retract limit check X0CF	· Out-carrier was conveyed, but the out-carrier advance limit or retract limit sensor failed to switch on. · An Out-carrier cycle error occurs if the advance limit or retract limit sensor fails to switch on within 8 seconds.	M:Sect 3.3
		(2) Check the carrier conveyance cylinder for problem (7) (see above). Execute the following commands to see if the carrier can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[Out-side]-[Carrier Extend/Carrier Retract]-[START].	Carrier may not be moving all the way to its motion limit position.	S:Sect 3.1
4-8	Out-carrier clamp error	(1) Check the following sensors for problems (3) - (6) (see above). Out-carrier retract limit panel clamp check (fixed-rail side) X0D2 Out-carrier retract limit panel clamp check (adjustable-rail side) X0D3 Out-carrier advance limit pnale clamp check (fixed-rail side) X0D4 Out-carrier advance limit panel clamp check (adjustable-rail side) X0D5 Out-carrier retract limit panel unclamp check (fixed-rail side) X0D6 Out-carrier retract limit panel unclamp che	· Out-carrier clamper was closed, but the clamp sensor failed to switch on. · Out-carrier clamper was opened, but the unclamp sensor failed to switch on.	M:Sect 3.3
		(2) Check the out-carrier's panel clamping/ unclamping cylinder for problem (7) (see above). Execute the following commands to see if the carrier can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[Out-side]-[Carrier Extend/Carrier Retract]-[START].	Clamper may not be moving all the way to its motion limit position.	S:Sect 3.1
4-9	In-conveyor panel conveyance error	(1) Check the following sensor for problems (1) - (6) (described above). In-conveyor panel loading check X0B0	Panel request occurred, but the panel loading sensor failed to switch on.	M: :Sect 3.3
		(2) Check the following sensors for problems (1) - (6) (described above). In-conveyor 1 panel deceleration start point X0AB	In-conveyor panel deceleration sensor failed to switch on even though the panel passed the in-conveyor panel loading sensor position.	
		(3) Check the following sensors for problems (1) - (6) (described above). In-conveyor 1 panel arrival check X0AC	In-conveyor panel sensor failed to switch on even though the panel passed the in-conveyor panel deceleration sensor.	
		(4) Check the in-conveyor motor for problem (7) (see above). In-conveyor motor ON Y029	The in-conveyor motor may not be operating	S:Sect 3.1
		(5) If the panel is caught at some point along the conveyor, change the conveyor width.		M:Sect 4.1

* The "X???" and "Y???" values which appear in the remedy column correspond to the I/O map assignment numbers.

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No.	Cause	Remedy	Remarks	Ref. Page
4-10	In-lifter cycle error	(1) Check the following sensors for problems (3) - (6) (see above). In-lifter UP limit check X0B5 In-lifter DOWN limit check X0B6	In-lifter UP/DOWN limit sensor fails to switch on and off.	M:Sect 3.3
		(2) Check the in-lifter UP/DOWN cylinder for problem (7) (see above). Execute the following commands to see if the lifter can be moved to its motion limit position: [Panel Loader]-[Loader Maintenance]-[In-side]-[Lifter Up/Lifter Down]-[START].	Lifter may not be moving all the way to its motion limit position.	S:Sect 3.1
4-11	In-lifter panel conveyance error	(1) Check the following sensors for problems (1) - (6) (described above). In-conveyor 1 panel arrival check X0AC	Panel loading from the in-lifter to the in-carrier began, but the panel arrival sensor switched off before the in-carrier was advanced.	M:Sect 3.3
4-12	Panel unloading error	(1) Check the following sensor for problems (1) - (6) (described above). Out-conveyor unloader panel arrival check X0CB	A panel which should have been unloaded has not been conveyed to the X0CB sensor position. Look for a failed ensor, a stuck panel, or a missing panel.	M:Sect 3.3
		(2) Check the out-conveyor motor for problem (7) (see above). Out-conveyor motor ON Y02D		S:Sect 4.1
		(3) If the panel is caught at some point along the conveyor, change the conveyor width.		M:Sect 3.3
4-13	Out-lifter cycle error	(1) Check the following sensors for problems (3) - (6) (see above). Out-lifter UP limit check X0D0 Out-lifter DOWN limit check X0D1	Out-lifter UP/DOWN limit sensors fail to switch off and on.	M:Sect 3.3
		(2) Check the out-lifter UP/DOWN cylinder for problem (7) (see above). Execute the following commands to see if the lifter can be moved to its motion limit position: [PanelLoader]-[Loader Maintenance]-[Out-side]-[Carrier Extend/Carrier Retract]-[START].	Lifter may not be moving all the way to its motion limit position.	S:Sect 3.1
4-14	Out-lifter panel conveyance error	(1) Check the following sensors for problems (3) - (6) (see above). Out-conveyor 1 panel arrival check X0C7	Out-conveyor panel arrival sensor fails to switch on even though the panel has been loaded from the out-carrier to the out-lifter.	M:Sect 3.3
		(2) Check the following sensor for problems (1) - (6) (described above). Out-conveyors 1 & 2 panel spacing check X0CA	The panel spacing sensor between out-conveyors 1 & 2 is off (it should be on). Either the spacing sensor has failed, or the sensor detection position is improper.	
4-15	Adjustable-rail engagement error	(1) Check the following sensors for problems (3) - (6) (see above). Adustable-rail engagement check (IN) X0C0 Adjustable-rail engagement check (OUT) X0DB Adjustable rail engagement check (CENTER) X0DC	Adjustable-rail engagement sensor fails to switch on. Verify that the conveyor width and the XY-table panel conveyence width are properly aligned.	M:Sect 3.3
		(2) Disconnect the machine's air supply and return the adjustable rail to the correct position.		

* The "X???" and "Y???" values which appear in the remedy column correspond to the I/O map assignment numbers.

C746M5TO7

No.	Cause	Remedy	Remarks	Ref. Page
4-16	XY-table clamp error	(1) Verify that the XY-table is clamping panels properly.	· Panel was clamped, but the clamp sensor failed to switch on, and the unclamp sensor failed to switch off. · Panel was unclamped, but the unclamp sensor failed to switch on, and the clamp sensor failed to switch off.	M:Sect 3.3
		(2) Check the following sensors for problems (3) - (6) (see above). XY-table panel clamp check (fixed-rail side, right) X05F XY-table panel clamp check (adjustable-rail, right) X060 XY-table panel unclamp check (fixed-rail, righ X061 XY-table panel unclamp check (adjustable-rail, right) X062 XY-table panel clamp check (fixed-rail, left) X063 XY-table panel unclamp check (fixed-rail, left) X064		
		(3) Check the panel clamping/unclamping cylinder for problem (7) (see above). Execute the following commands to see if the cylinder can be moved to its motion limit position: [Panel Loader]-[Clamp/Unclamp]-[START].	The clamping cylinder may not be moving all the way to its motion limit position.	S:Sect 3.1

* The "X???" and "Y???" values which appear in the remedy column correspond to the I/O map assignment numbers.

C746M5T08

8.1.5 Missing Parts

No.	Cause	Remedy	Remarks	Ref. Page
5-1	Incorrect Part data setting.	Specify the appropriate nozzle size and cam speed settings using the Tech Report issued by Fuji as a reference.	Unsuitable nozzle size, part weight, and cam speed, etc., settings can result in an insufficient holding force when handling parts, causing nozzle and part slippage. The Fuji Tech Report is meant for reference purposes only. The recommended cam speed may be different even if the part shape is the same.	T: Part 3, Lesson 2 "2.1.3" U: Part 2 Chapt 4 "Nozzle" "Speed"
		If accuracy deviations or missing parts are occurring for a specific part, decrease the XY table speed setting in the Part data where the problem is occurring.	An unsuitable XY table speed can apply a force which exceeds the holding capacity of the part's solder, resulting in position deviations. Solder adhesion decreases when it dries. Therefore, the sooner placement occurs after printing, the better.	T: Part 3 Lesson 2 "2.1.3" U: Part 2 Chapt 4 "Speed"
		Check for errors in the part height information.	Errors in the part height information or in the table reference height Proper data information can cause missing parts. Fuji recommends that the actual part be measured, with the measured value being entered as the part height setting in Part data.	T: Part 3 Lesson 2 "2.1.1" U: Part 2 Chapt 4 "Appearance"
5-2	Defective nozzle.	(1) Press the reflective disk to verify that the nozzle spring-back motion is smooth. (2) Check to see if the nozzle is clogged. (3) Check to see if foreign matter has adhered to the nozzle tip. Replace the nozzle if any of the above problems are found.	A stuck nozzle will prevent the parts from being pushed in far enough when being mounted, and may result in the parts being returned.	M:Sect 5.1 M:Sect 6.1
			Parts may be returned if solder, etc., is adhering to the nozzle tip.	
5-3	Placement height problem.	Check the backup pin height, quantity, and configuration, and check the board's flatness.	A misalignment between the ST9 nozzle DOWN limit and the board height can prevent parts from being pushed in far enough when being placed, and may affect placing accuracy.	M:Sect 4.2
		Check to see if the XY-table is level.	Note: If a problem is found, contact your Fuji agent.	
		Replace the cylinder unit if abnormal noise is emitted from the cam box uring automatic operation, or if the nozzle DOWN limit position is incorrect.	Improper ST9 cylinder operation may prevent parts from being placed correctly. Note: If a problem is found, contact your Fuji agent.	
		Check for a problem with the Proper data Z0 (0.3mm push in).	Note: Machine adjustments can be performed only by those with a Level 3 training.	
5-4	Vacuum break problem	Replace mechanical valves where the spool motion is not smooth.	Vacuum break problems can result in parts being returned.	M:Sect 7.1.4
		Adjust the vacuum break lever position and the speed controller.		
5-5	Printing conditions problem.	Check the solder condition after printing.	The solder printing condition or dryness can cause part deviations during board conveyance, or can affect the self-alignment at reflow operations. Solder adhesion weakens when the solder dries. Therefore, the sooner placement occurs after printing, the better.	
5-6	Reflow conditions problems.	Check the reflow temperature profile.	Improper reflow conditions can cause self-alignments and tombstoning. Provide a profile in which the temperature is increased evenly over the entire board. If the solder's melting speed differs from point to point, parts will be pulled toward the solder that melts first.	

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8.1.6 Part Height Sensor Errors

No.	Cause	Remedy	Remarks	Ref. Page
6-1	Nozzle length warning displays	Replace the nozzle where this warning occurs, then easure the nozzle length again.	If the measured nozzle length exceeds the permissible value, a warning displays onscreen.	
6-2	Dust alarm (dust detected on part height sensor)	Clean the glass surface of the part height sensor.	This error occurs when dust has adhered to the part height sensor's camera lens. Automatic operation continues unless the quantity of dust is such that it hinders the measurements. Note: Clean away the dust using cotton swab, etc.	M:Sect 5.1.5
6-3	Part tombstoning detection error	Check the height of the part where the error occurred, and enter the correct setting value.	Error occurs because the Part data setting differs from the height of the part which was picked up.	T: Part 3 Lesson 2 "2.1.1" U: Part 2 Chapt 4 "Appearance"
		Check the part height tolerance value (%) for the part where the error ocurred, and enter the correct setting value.	Error occurs because an unsuitable part height tolerance value is specified in Part data. The tolerance value varies according to the part type. Verify that the tolerance value is appropriate for the part in question. (Refer to the tolerance values recommended by Fuji.)	T: Part 3 Lesson 2 "2.1.1"
		Use the nozzle check command to perform a nozzle length measurement. Replace the nozzle if its length is outside the tolerance range.	A part may be picked up in a tombstoned posture if the nozzle length measurement result differs from the actual nozzle length When using part height information, measure the nozzle length before production begins.	M:Sect 5.1.4 M:Sect 6.1
		(1) Use the nozzle check command to check for a bent nozzle. (2) Press the reflective disk with your finger to verify that the nozzle spring-back motion is smooth. (3) Check for a clogged nozzle. Replace the nozzle if any of the above problems are found.	A bent nozzle will cause a deviation in the part pickup position, and may result in the part being picked up in a tombstoned posture.	
			A stuck nozzle cannot adequately reach the part, and may result in the part being picked up in a tombstoned posture.	
			A clogged nozzle will have less vacuum force, and may result in the part being picked up in a tombstoned posture.	
6-4	The 7-segment display always shows the same value, or shows the wrong value.	Turn the cam handle and check the LED lamp status on the sensor (for acquisition timing) inside the cam box. If there is a problem with the sensor, replace it.	A malfunctioning "acquisition timing" sensor can cause the 7-segment display to always show the same value, or to show the wrong value. Note: If sensor replacement is required, contact your Fuji agent for assistance.	

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8.2 Servo System Troubleshooting

An AC servo system controls all servo axes in the machine. If there is a problem with the servo system, the machine displays an alarm code to notify the operator.

This section describes alarm codes and inspection methods, and should be used as a reference for troubleshooting and resolving problems.

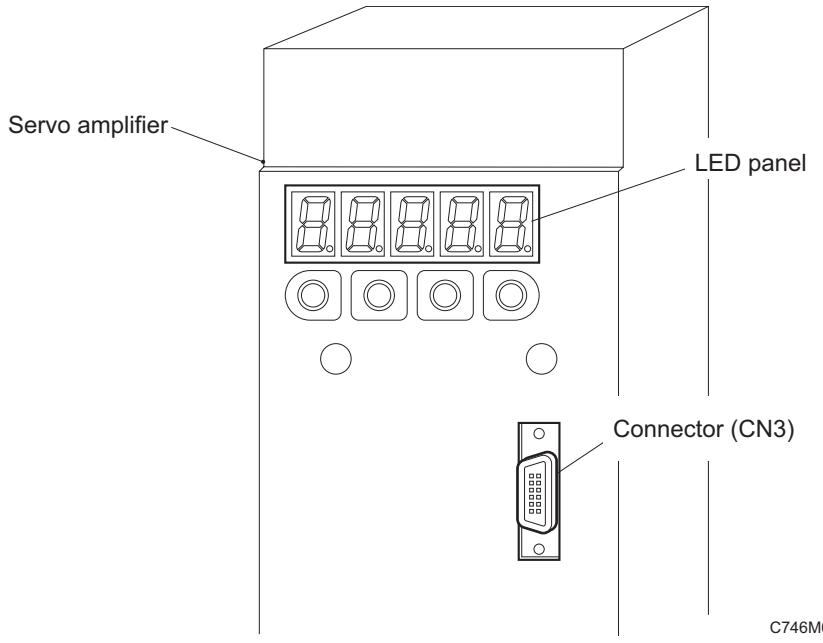
8.2.1 Alarm Code Display

Each servo amp has an LED panel to display alarm codes.

The following illustrations show the location of each servo amplifier's LED panel.

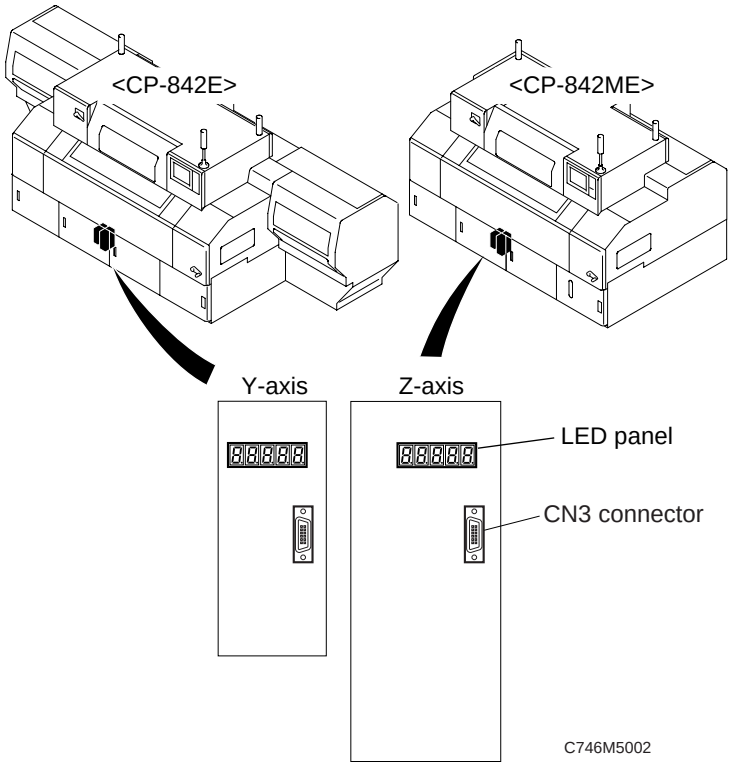
⚠ warning

The servo amplifier power terminal is high voltage.
Absolutely do not touch the servo amplifier power terminal.

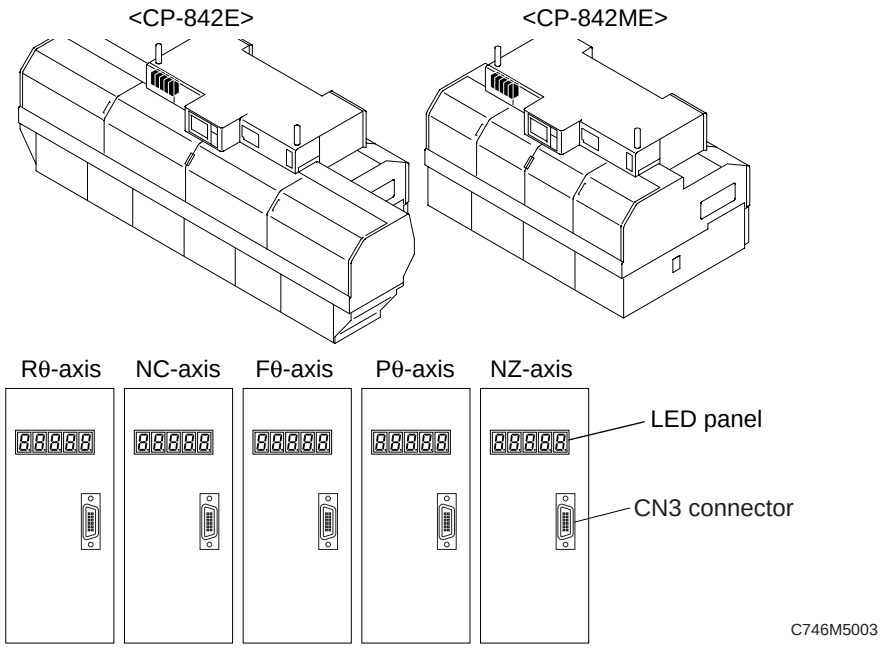


Note: To display the alarm code on the digital operator, connect the digital operator cable to the servo amplifier (CN3 connector).

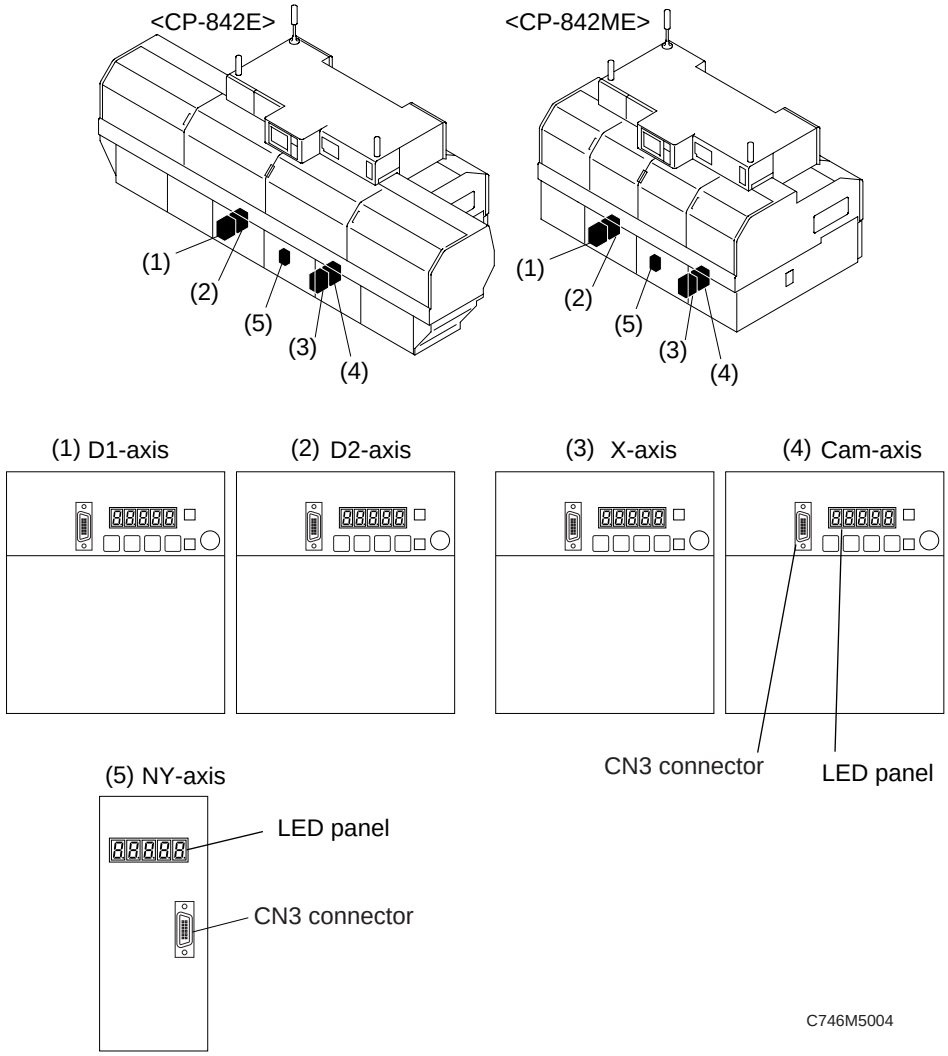
X- and Y-Axes Servo Amplifier Alarm Display



Rq-, NC-, Fq-, Pq-, and NZ-Axes Servo Amp Alarm Display



X-, D1-, D2-, Cam-, and NY-Axes Servo Amp Alarm Display



8.2.2 Alarm Codes and Troubleshooting Check List

Alarm status, cause, and remedy are listed in the following table to facilitate troubleshooting of alarm codes.

Note: Some of the repairs, such as replacement of a servo motor or servo pack, require special training and expertise. Contact a Fuji agent before attempting to perform any of these procedures. Please have the "Check List for Troubleshooting" available for reference when contacting a Fuji agent for assistance.

AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.02	Parameter Break-down	• Occurs at power ON.	• Servopack power supply malfunctions. • Servopack defective.	• Does AC power supply sometimes provide 30V to 60V?	• Restore the AC power supply. • Replace the Servopack.
A.03	Main Circuit Detector Error	• Occurs at power ON or during operation	• Servopack power supply malfunctions. • Servopack defective.	• Does AC power supply sometimes provide 30V to 60V?	• Restore the AC power supply. • Replace the Servopack.
A.04	Parameter Setting Error	• Occurs at power ON or during operation.	• Servopack defective. • SERCOS IF defective.		• Replace the Servopack. • Replace the SERCOS IF.
A.05	Combination Error	• Occurs at power ON.	• Servopack capacity does not match motor capacity. • Servopack defective.	• Check the combination of Servopack capacity and motor capacity. • Servopack defective.	• Match the Servopack capacity to the motor capacity. • Replace the Servopack. • Replace the motor.
A.10	Overcurrent	• Occurs at control power ON.	• Servopack defective. • Servopack detects overcurrent by mistake. • Failure in electronic overload thermal relay forced reset for overload alarm		• Replace the Servopack.
		• Overcurrent occurs at main power ON or during motor operation.	• Grounding: Grounding in motor or motor cable wiring. • Shortcircuit in load: Load short-circuit in motor or motor cable • Shortcircuit in load: Load short-circuit in main circuit in Servopack.	• Improper connection between phases U, V and W and ground, shortcircuit between phases or incorrect ground wiring. • Use a tester to check between phases U, V and W. • DB circuit or regenerative circuit resistor or wiring grounding.	• Replace the motor or manually correct the motor cable to eliminate grounding. • Replace the motor or manually correct the motor cable to eliminate grounding. • Replace the Servopack.

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AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.30	Regenerative Error Detected	· Occurs at control power ON.	· Servopack defective.		· Replace the Servopack.
		· Occurs at main power ON.	· Wiring to regenerative resistor defective. · Servopack defective. · Incorrect regenerative resistor wiring. · Regenerative resistor disconnected.	· Check the wiring to regenerative resistor. · Servopack defective. · Check that wiring to the regenerative resistor is proper. · Check the regenerative resistance value.	· Check the regenerative value and correct the wiring. · Replace the Servopack. · Manually correct the wiring of the external regenerative resistor. · Replace the external regenerative resistor.
A.32	Regenerative overload	· Occurs at control power ON.	· Servopack defective.		· Replace the Servopack.
		· Occurs at normal operation.	· Parameter Pn600 set value is not correct when a regenerative resistor is mounted externally. · Servopack defective.	· Check that parameter Pn600 set value is correct. · Servopack defective.	· Set parameter Pn600 correctly. · Replace the Servopack.
A.40	Overvoltage	· Occurs at control power ON.	· Servopack defective.		· Replace the Servopack.
		· Occurs at main power ON or when motor is in operation.	· Excessive power supply voltage. · Servopack defective.	· Check the AC power supply voltage. (Is there excessive voltage variation?) · Servopack defective.	· Set the AC power supply voltage to a value in the normal setting range. · Replace the Servopack.
A.41	Undervoltage	· Occurs at control power ON.	· Servopack defective.		· Replace the Servopack.
		· Occurs at main power ON or when motor is in operation.	· Power supply voltage is excessively small. · Servopack defective. · Power supply variation is large and power supply is reduced.	· Check the AC power supply voltage. (Pay attention to different power supply applied.) · Servopack defective. · Check that a momentary power failure has not occurred.	· Set the AC power supply voltage to a value in the normal setting range. · Replace the Servopack.

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AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.51	Overspeed	• Occurs at control power ON.	• Servopack defective.		• Replace the Servopack.
		• Occurs at main power ON or when motor is in operation.	• Incorrect motor wiring.	• Check that the motor rotating direction is correct (phases U, V and W wiring).	• Manually correct the motor wiring.
			• Incorrect encoder wiring.		• Manually correct the encoder wiring.
			• Servopack defective.	• Servopack defective.	• Replace the Servopack.
A.71	Overload for Instantaneous Maximum Load	• Occurs at control power ON.	• Servopack defective.		• Replace the Servopack.
A.72	Overload for Continuous Minimum Load	• Occurs at main power ON or when motor is in operation.	• Incorrect motor wiring. (imperfect wiring or connection)	• Check that the connnection is correct and that the motor wiring does not have an open phase.	• Manually correct the motor wiring.
			• Incorrect encoder wiring. (imperfect wiring or connection)		• Manually correct the encoder wiring.
			• Servopack defective.	• Servopack defective. • Excessive load on servo.	• Replace the Servopack. • Check for excessive load on components driven by the servo.
A.73	Dynamic Brake Overload		• Servopack defective.		• Replace the Servopack.
A.74	Overload of in-rush Current Limit Resistor	• Occurs at control power ON.	• Servopack defective.		• Replace the Servopack.
		• Occurs at main circuit power supply ON/OFF.	• The allowable frequency of in-rush current limit resistor at power ON/OFF is exceeded.	• Check that the allowable frequency of in-rush current limit resistor (5 times/min) is not exceeded.	• Reduce the main circuit power supply ON/OFF frequency to 5 times/min.
			• Servopack defective.		• Replace the Servopack.
A.7A	Heat Sink Overheated	• Occurs at main power ON or when motor is in operation.	• Servopack defective.	• Check that the Servopack fan is operating. • Check that the fan for the control board is operating.	• Replace the Servopack.
			• Ambient temperature of the Servopack exceeds 35 °C.	• Check the ambient temperature of the Servopack exceeds 35 °C. • Excessive load on servo.	• Set the ambient temperature of the Servopack to 35 °C or less. • Check for excessive load on components driven by the servo.

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AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.81	Absolute Encoder Backup Error	· Occurs at power ON. (Pn002.2 = 0) When used as absolute encoder.	· Turn ON the power supply to the absolute encoder for the first time.	· Check that the absolute encoder has been set up.	· Set up the encoder.
			· Both PG power supply (+5V) from the Servopack and the battery power supply are failed.	· Check that the power is supplied to the encoder side.	· Set up the encoder after restoring the power supply to the encoder (by replacing the battery, etc.).
			· Absolute encoder defective.	· Encoder defective at alarm occurrence even by setting up the absolute encoder again.	· Replace the encoder.
			· Servopack defective.	· Servopack defective if nothing is wrong in the above check.	· Replace the Servopack.
		· Occurs at power ON. (Pn002.2=1)	· Servopack defective when used as incremental encoder.		· Replace the Servopack.
A.82	Encoder Checksum Error	· Occurs at power ON or when motor is in operation.	· Encoder defective.		· Set up the encoder. Replace the motor if the alarm occurs frequently.
			· Servopack defective.		· Replace the Servopack.
A.83	Absolute Encoder Battery Error	· Occurs at power ON. (Pn002.2=0) When used as absolute encoder.	· Imperfect connection or disconnection of battery.	· Check that the battery is connected correctly.	· Connect the battery properly.
			· Battery voltage is reduced to the specified value (2.7 V) or less.	· Check that the battery voltage is not reduced to 2.7 V or less.	· Replace the battery and turn ON the encoder power supply again.
			· Servopack defective.	· Servopack defective if nothing is wrong in the above check.	· Replace the Servopack.
		· Occurs at power ON. (Pn002.2=1)	· Servopack defective when used as incremental encoder.		· Replace the Servopack.
A.84	Encoder Data Error	· Occurs at power ON or when motor is in operation.	· Sensor in the encoder reads the data improperly.		· Turn ON the encoder power supply again. Replace the motor if the alarm occurs frequently.
			· Encoder malfunctions.		· Correct the wiring processing around the encoder.
			· Servopack defective.		· Replace the Servopack.

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AC Servopack			AC Servopack		
Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.85	Encoder Overspeed	• Occurs at power ON or when motor is in operation.	• Servopack defective.		• Replace the Servopack.
A.86	Encoder Overheated	• Occurs at power ON or when motor is in operation.	• Encoder defective. • Servopack defective. • Encoder temperature exceeds the specified value.	• Check the ambient temperature for the motor exceeds 35 C?	• Replace the motor. • Replace the Servopack. • Reduce the ambient temperature of the motor to 35 C or less.
A.b1	Reference Speed Input Read Error	• Occurs at power ON or when motor is in operation.	• Servopack defective.		• Replace the Servopack.
A.b2	Reference Torque Input Read Error	• Occurs at power ON or when motor is in operation.	• Servopack defective.		• Replace the Servopack.
A.bF	System Alarm	• Occurs at power ON or when motor is in operation.	• Servopack defective.		• Replace the Servopack.
A.C1	Servo Overrun	• Occurs at power ON.	• Incorrect motor wiring. • Incorrect encoder wiring. • Encoder defective. • Servopack defective.	• Check the motor wiring or connector inserted status at the motor side. • Check the encoder wiring and the connector inserted status at the encoder side. • Encoder defective. • Check the encoder and motor wiring to motors A and B, if it is a multiaxis amp.	• Manually correct the motor wiring. • Manually correct the encoder wiring. • Replace the motor. • Replace the Servopack.
A.C2	Phase Error	• Occurs at power ON or when motor is in operation.	• Servopack defective. • Encoder defective. • Incorrect encoder wiring.	• Encoder defective (Initialization polarity sensor data error) • Check the encoder wiring and the connector inserted status at the encoder side.	• Replace the Servopack. • Replace the motor. • Manually correct the encoder wiring.

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AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.C5	Magnetic Polarity Detection Error		· Power supply to the main circuit is turned off. · Incorrect encoder wiring. · Encoder defective. · Servopack defective.	· Check the power supply to the main circuit. · Check the encoder wiring. · Servopack defective.	· Check connections around the power supply to the main circuit. · Replace the motor. · Replace the Servopack.
A.C6	PA-, PB-phase connection error	· Occurs at power ON or when motor is in operation.	· Servopack defective. · Incorrect encoder wiring. · Encoder defective.	· Check the encoder wiring. · Servopack defective.	· Replace the Servopack. · Manually correct the encoder wiring. · Replace the motor.
A.C7	C-phase connection error				
A.C8	Absolute Encoder Clear Error and Multiturn Limit Setting Error	· Occurs at power ON.	· Encoder defective. · Servopack defective.		· Replace the motor. · Replace the Servopack.
		· Occurs at encoder alarm reset.	· Encoder defective. · Servopack defective.		· Replace the motor. · Replace the Servopack.
A.C9	Encoder Communi-cations Error	· Occurs at power ON or during operation.	· Encoder wiring incorrect or poor connection. · Encoder defective. · Servopack defective.	· Check the encoder wiring or connector insertion at the encoder side. · Encoder defective. · Servopack defective.	· Manually correct the encoder wiring. · Replace the motor. · Replace the Servopack.
A.CA	Encoder Parameter Error	· Occurs at power ON.	· Encoder defective. · Servopack defective.		· Replace the motor. · Replace the Servopack.
		· Occurs during operation.	· Encoder defective. · Servopack defective.		· Replace the motor. · Replace the Servopack.

C746M5T18

AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.Cb	Encoder Echoback Error	• Occurs at power ON or during operation.	• Encoder wiring incorrect or poor connection . • Encoder defective. • Servopack defective.	• Check the encoder wiring or connector insertion at the encoder side. • Encoder defective. • Servopack defective.	• Manually correct the encoder wiring. • Replace the motor. • Replace the Servopack.
A.CC	Multiturn Limit Disagreement	• Occurs at power ON.	• Servopack parameter is wrong. • The multiturn limit has not been set in the encoder.	• Check parameter Pn205. • A.CC occurs even if the Pn205 setting is correct.	• Correct the Pn205 setting (Refer to the parameter list supplied with the machine). • Execute the multiturn limit setting change Fn013 when the alarm occurs.
		• Occurs during operation.	• Servopack defective.		• Replace the Servopack.
A.d0	Position Error Pulse Overflow	• Occurs at control power ON.	• Servopack defective. • Parameter Pn505 value is 0.	• Check the parameter (overflow: Pn505).	• Replace the Servopack. • Correct the Pn505 setting (Refer to the parameter list supplied with the machine).
		• Occurs during operation.	• Imperfect motor wiring. • Imperfect encoder wiring. • Servopack defective. • Load capacity is too large.	• Check that the motor U, V and W wiring is correct. • Excessive load on servo.	• Manually correct the motor wiring. • Manually correct the encoder wiring. • Replace the Servopack. • Check for excessive load on components driven by the servo.
A.F1	Power Line Open Phase	• Occurs at control power ON.	• Servopack defective.	• Servopack defective.	• Replace the Servopack.
		• Occurs at main power ON or when motor is in operation.	• 3-phase power supply is not connected. • 3-phase power supply is imbalanced. • Servopack defective.	• Check the power supply voltage. • Check the power supply voltage. • Servopack defective.	• Manually correct the power supply wiring. • Correct the power supply imbalance. • Replace the Servopack.

C746M5T19

AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.E0	SERCOS IF Unset	• Occurs at (10 sec. after) control power on.	• SERCOS IF CPU is set to nonoperation (SERCOS IF status (S or ST) LED (green) does not come on). • SERCOS IF does repeater operation only.		• Set the switches 1 to 3 on the servo amp according to the electrical schematic.
			• Problem with the SERCOS IF connection.	• Check that the connector between the SGDH and the SERCOS IF, or the base board and the SERCOS IF (SGDZ) are connected properly.	• Reattach the connector between the SGDH and the SERCOS IF. • Reattach the connector between the base board and the SERCOS IF.
			• Base board defective. (SGDZ)	• Base board defective. (SGDZ)	• Replace the base board. (SGDZ)
			• SERCOS IF defective.	• SERCOS IF defective. (DPRAM (SGDH), CPU defective)	• Replace the SERCOS IF.
			• Servopack defective.	• Servopack defective. (When using SGDZ, DPRAM defective)	• Replace the Servopack.
A.E2	WDC Error	• Occurs after the initialization of the SERCOS communications.	• Fiber optics are cut.	• Check if the fiber optics connector is detached or if the connection is cut.	• Manually readjust the fiber optics cabling.
			• Power is off at one of the other servo amps in the SERCOS communications loop.	• Check if “bb” is flashing (SGDH) at one of the servo amps within the loop, or if its power is off.	• Manually readjust the power and power wiring.
				• Check for power alarms such as sudden stoppage.	• Improve the power source.
			• Servo board is defective.	• Check for alarms such as cuts in servo board communications.	• Replace the Servopack.
			• SERCOS IF is defective.	• SERCOS IF is defective.	• Replace the SERCOS IF.
A.E3	MST Loss	• Occurs after the initialization of the SERCOS communications.	• Servo board is defective.	• Check for alarms such as cuts in servo board communications.	• Replace the Servopack.
			• SERCOS IF is defective.	• SERCOS IF is defective.	• Replace the SERCOS IF.

C746M5T20

AC Servopack — Check List for Troubleshooting

Alarm	Alarm Name	Status	Cause	Check Item	Remedy
A.E4	MDT Loss	• Occurs after the initialization of the SERCOS communications.	• Fiber optics are cut.	• Check if the fiber optics connector is detached or if the connection is cut.	• Manually readjust the fiber optics cabling.
			• Servo board is defective.	• Check for alarms such as cuts in servo board communications.	• Replace the Servopack.
			• SERCOS IF is defective.	• SERCOS IF is defective.	• Replace the SERCOS IF.
A.E7	SERCOS IF Error	• Occurs at power ON.	• SERCOS IF is not connected correctly. • SERCOS IF is defective.	• Check that the connector between the SGDH and the SERCOS IF is connected properly. • SERCOS IF is defective. (DPRAM is defective).	• Reattach the connector. • Replace the SERCOS IF.
CPF00	Digital Operator Transmission Error 1	• Occurs at power ON when the digital operator is connected or when the digital operator is connected after power ON. (Whether transmission is established is determined by checking the data code of the signal that is sent every approx. 100 msec from the Servopack. If the data code is normal, transmission is established.)	• Imperfect connection between the digital operator and Servopack.	• Incorrect cable or connection between the digital operator and Servopack.	• Insert the connector again or replace the cable.
CPF01	Transmission Error 2		• Digital operator defective.	• Digital operator control defective.	• Replace the digital operator.
			• Servopack defective.	• Servopack defective.	• Replace the Servopack.

C746M5T21

AC Servopack — Check List for Troubleshooting

Warning	Warning Name	Status	Cause	Check Items	Remedy
A.91	Overload Warning	• Occurs at control power ON.	• Servopack defective.		• Replace the Servopack.
		• Occurs at servo ON.	• Incorrect motor wiring. (imperfect wiring or connection) • Incorrect encoder wiring. (imperfect wiring or connection) • Servopack defective.	• Check that the motor wiring does not have open-phase or the connection is correct. • Servopack defective.	• Manually correct the motor wiring. • Manually correct the encoder wiring. • Replace the Servopack.
		• Occurs with reference input without motor rotation.	• Incorrect motor wiring. (imperfect wiring or connection) • Incorrect encoder wiring. (imperfect wiring or connection) • Load exceeds rated load. • Servopack defective.	• Check that the motor wiring does not have open-phase or the connection is correct. • Excessive load on servo. • Servopack defective.	• Manually correct the motor wiring. • Manually correct the encoder wiring. • Check for excessive load on components driven by the servo. • Replace the Servopack.
		• Occurs at normal operation.	• Ambient temperature of the Servopack exceeds 35 C. • Servopack defective.	• Check the ambient temperature of the Servopack exceeds 35 C. • Servopack defective.	• Set the ambient temperature of the Servopack to 35 C or less. • Replace the Servopack.
A.92	Regenerative Overload Warning	• Occurs at control power ON.	• Servopack defective.		• Replace the Servopack.
		• Occurs at normal operation.	• Parameter Pn600 set value is not correct when a regenerative resistor is mounted externally. • Servopack defective.	• Check that parameter Pn600 set value is correct. • Servopack defective.	• Set parameter Pn600 correctly. (Refer to the parameter list supplied with the machine). • Replace the Servopack.

C746M5T22

MEMO:

9. Setup

9.1 Leveling the Machine

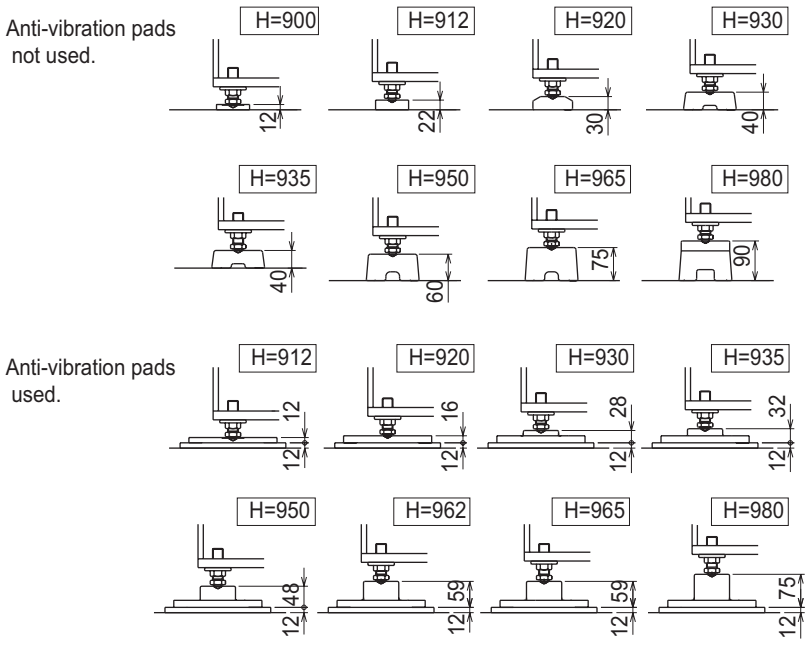
Point

The machine should be set in position on leveling sheets or blocks. The appropriate leveling sheets and blocks differ depending on the panel conveyance height, and the use of anti-vibration pads. Refer to the table below.

Units (mm)

	Board conveyance height	Leveling sheet / block		
		Drawing No.	Name	Height
Anti-vibration pads not used.	900	DCAB0370	Leveling sheet	12
	912	DCAB0380	Leveling sheet	22
	920	BB43880	Leveling sheet	30
	930	GGA8060	Leveling sheet	40
	935	GGA8060	Leveling sheet	40
	950	GGA8030	Leveling sheet	60
	962	——	——	——
	965	GGA8040	Leveling sheet	75
	980	BB42950	Leveling sheet	90
Anti-vibration pads used.	900	——	——	——
	912	DCAB0390	Leveling sheet	24 *
	920	GXA2071	Leveling sheet	28 *
	930	DCAB0400	Leveling block	40 *
	935	WAB0601	Leveling block	44 *
	950	GXA2121	Leveling block	60 *
	962	DCAB0410	Leveling block	71 *
	965	DCAB0410	Leveling block	71 *
	980	DCAB0420	Leveling block	87 *

* : Includes height of anti-vibration pads (12mm). C746M6T01



H: Board conveyance height Units (mm) C746M6001

Procedure

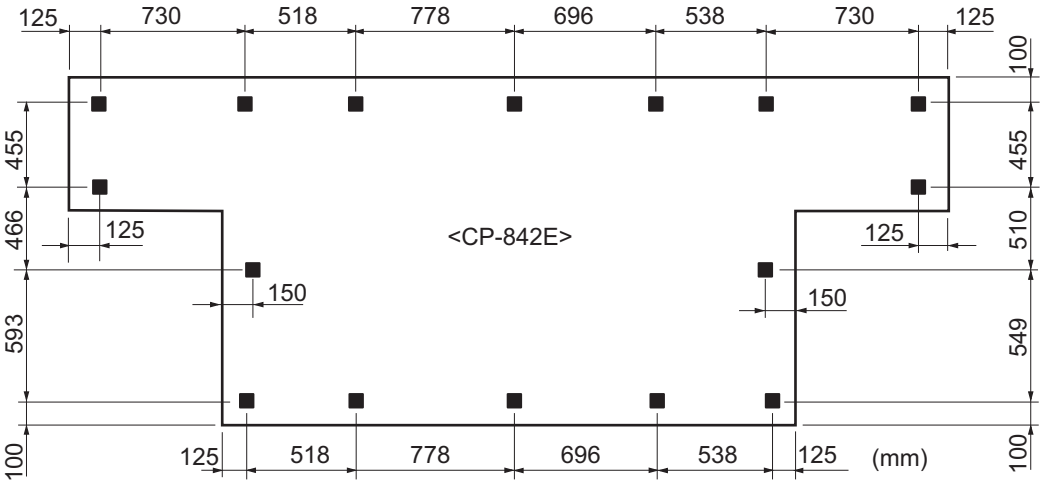
1 Position the leveling sheets or the leveling blocks as shown in the figure below.

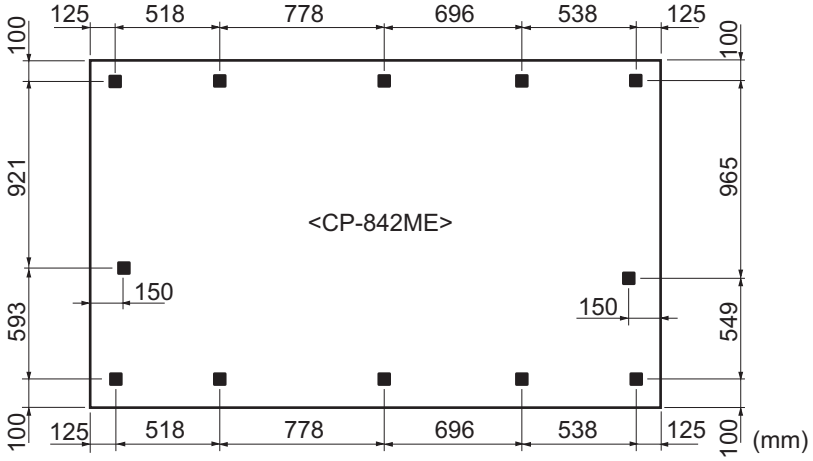
2 Set spirit levels on a base surface of the machine (laterally and vertically).

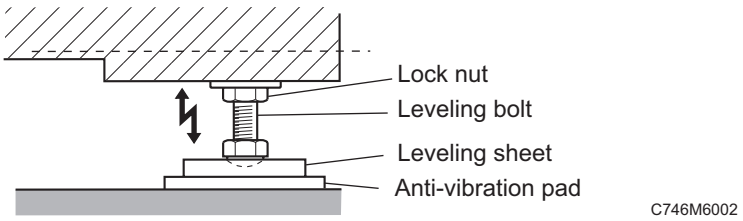
3 Use the leveling bolts to adjust the height.

4 After verifying that the panel conveyance height and the leveling accuracy are correct, tighten the lock nuts on the leveling bolts. Changes can be made by tightening the lock nuts, although the levelness should always be checked again after adjustments have been made.

Note: If the lock nuts are not tightened sufficiently, vibration may result in a drop in placement accuracy.







9.2 Connecting the Air Supply

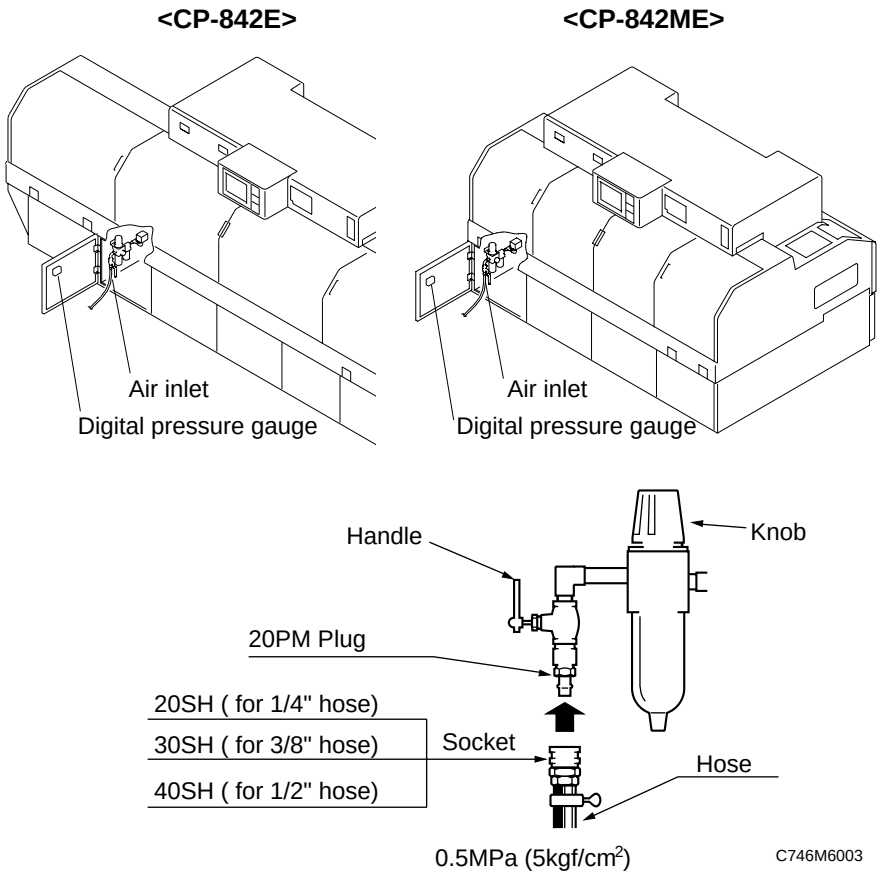
Point

Connect the air hose to the machine, and adjust the regulator to the prescribed air pressure.

Procedure

1. Connect the air hose to the machine's air inlet located on the front of the machine.
2. Raise the filter regulator knob to release the lock.
3. Turn the handle to adjust the air pressure until the gauge reads 0.5 MPa (5kgf/cm2).

   Note: A digital pressure gauge is attached to the rear cover.
4. Press the filter regulator knob down to engage the lock.



Note: The air hose is not supplied with the machine.

9.3 Electrical Power Supply & Transformer Wiring

Point

Wire the transformer so that its voltage matches the power supply voltage.

Procedure

⚠ *DANGER*

Verify that the external power supply is off before performing this procedure.

Connecting the Power Supply

The power capacities are indicated below. Be sure to connect the machine to a power supply which exceeds this capacity.

- CP-842E :9.5KVA
- CP-842ME :9.0KVA

1 Open the main breaker box, then remove the transparent terminal cover.

2 Feed the power cable into the main breaker box from the power cable inlet located at the top of the main breaker box.

3 Connect the ground cable to the dedicated ground terminal.

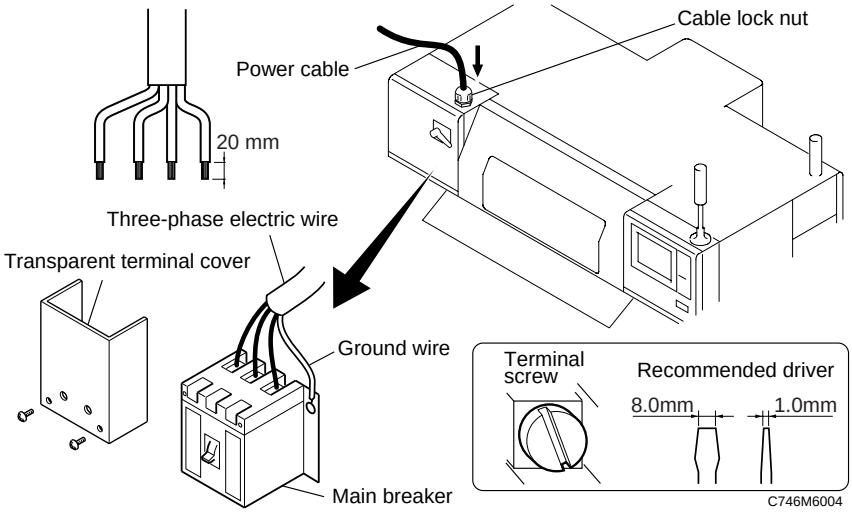
4 Connect the 3-phase cable to the main breaker and tighten to the prescribed torque.

Terminal screw tightening torque: 5.8 N·m (58 kgf·cm)

Note: Terminal screws should be tightened periodically.

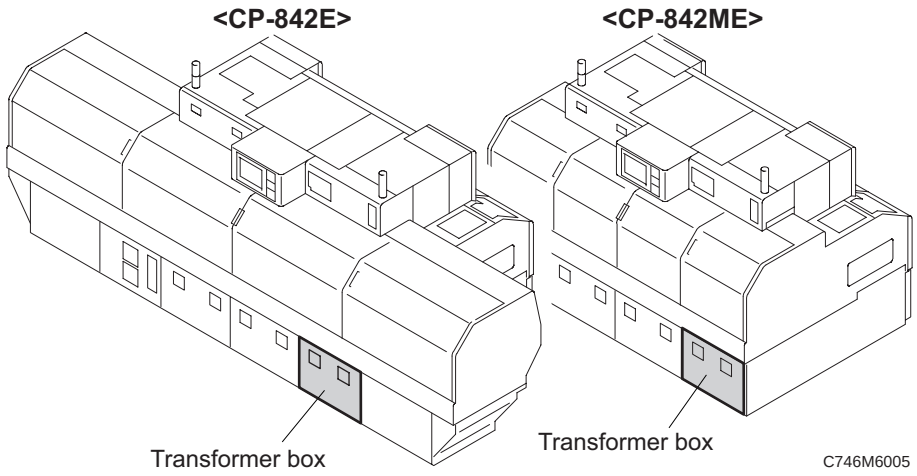
5 After connecting the cable, secure it with the cable lock nut located at the power cable inlet.

Cable lock nut tightening torque: 7.5 N·m (75 kgf·cm)



Wiring the Transformer

1 Open the transformer box cover.



2 Wire the transformer's primary taps to match the supplied voltage.

Checking the Three-phase Connections

Perform the following procedure to verify that the three-phases are properly connected.

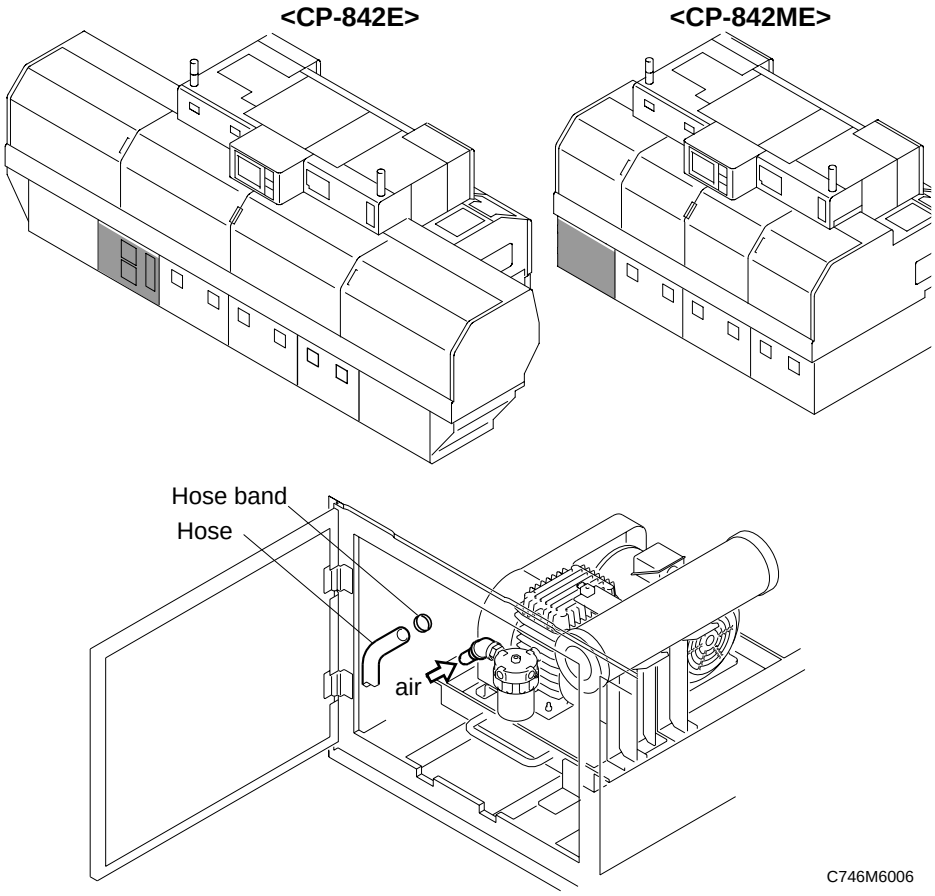
1 Turn the 200V power on.

2 Log in the machine.

3 Press the [AUTO] button (but do not press START).

Note: Do not press the START button.

The vacuum pump begins operating when [AUTO] is pressed, so disconnect the hose to verify that suction exists. If there is suction, this indicates that the wiring is correct and the motor is rotating in the correct direction. If the air flow is reversed (air is blowing out instead of in), then turn the main power off and reverse the three-phase power cable's U-phase and V-phase connections, then try again.



Caution: To avoid leaks, the hose should be pushed firmly into position, and then secured in position with the hose band.

9.4 Connecting the Data Transmission Cable

Point

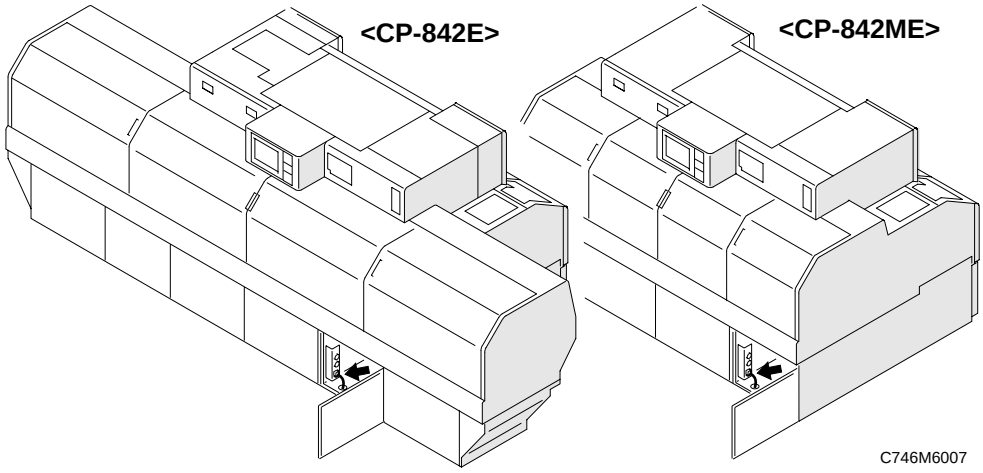
The machine is connected to the host computer by means of an Ethernet twisted-pair communication cable (class 5) which permits program transmissions and production log compilation.

Procedure

1 Register the CP-842E/842ME in the line descriptor file at the host.

Note: Refer to the host computer manual for details regarding the registration procedure.

2 Connect one end of the transmission cable to the Ethernet connector at the host, and connect the other end to the connector on the machine.



9.5 Moving the Machine

9.5.1 Precautions when Moving the Machine

When moving a machine, be sure to observe the safety measures described below in order to avoid accidents.

- Be sure that the workers who are moving the machine are wearing safety shoes and helmets.
- Prepare the transport path in advance, and be sure that those who are not assisting in the machine transport are kept out of the area.
- The machine should be moved only by qualified personnel.
- Before moving the machine, attach the machine brackets (red) which were attached when the machine was delivered. (Attach the brackets in the prescribed positions.)
- Use a forklift (load capacity of 10 t or higher) which is suitable for the weight of the machine in question.

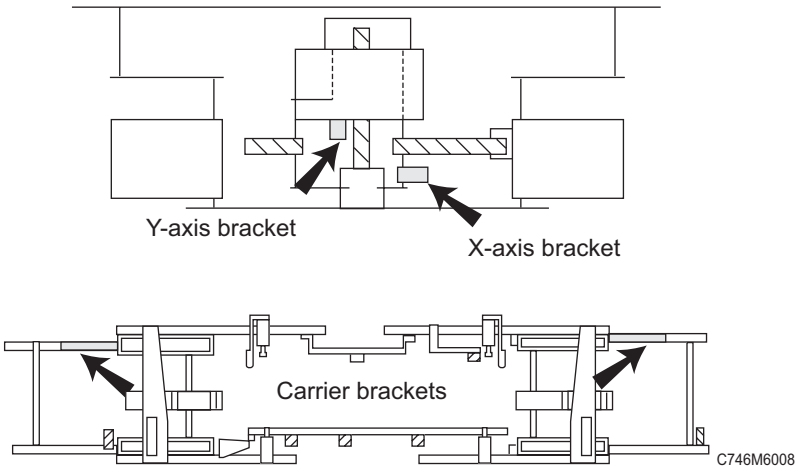
  Machine weights: CP-842E Approx. 5,850 kg

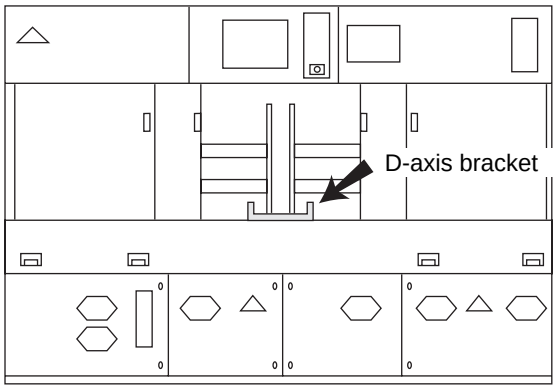
  CP-842ME Approx. 4,880 kg
- Be sure to insert the forklift forks at the prescribed position.
- Use care to avoid bending the leveling bolts.
- If the balance of a lifted machine is unstable, lower the machine immediately.
- Raise and lower the machine slowly to avoid subjecting the machine to shocks.

Transport Procedure

1. Remove all tape feeders, air hoses, and electrical wiring from the machine.
2. Use the machine brackets (red) to secure the XY-table, the in- and out-carriers, and the D-axes.

   Note: If there are no machine brackets available, use rope, etc., to secure the various parts of the machine to avoid damaging them.



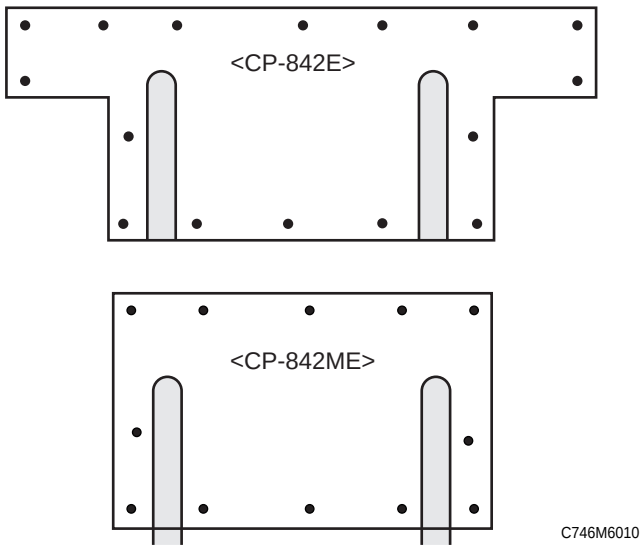


3 Insert the forklift so that its left and right forks are the same distance from the machine center. Moreover, the space between the left and right forks should be set as wide as possible.

⚠ *DANGER*

Do not attempt to perform any tasks beneath the lifted machine.

Note: The forklift should be operated in accordance with the manual provided by the forklift manufacturer.



4 Using the forklift, lift the machine to a height of 30 cm.

5 Transport the machine by forklift to its new location, then lower the machine slowly onto the leveling sheets or leveling blocks. For details concerning leveling sheet or leveling block configurations, refer to 9.1 "Leveling The Machine".

MEMO:

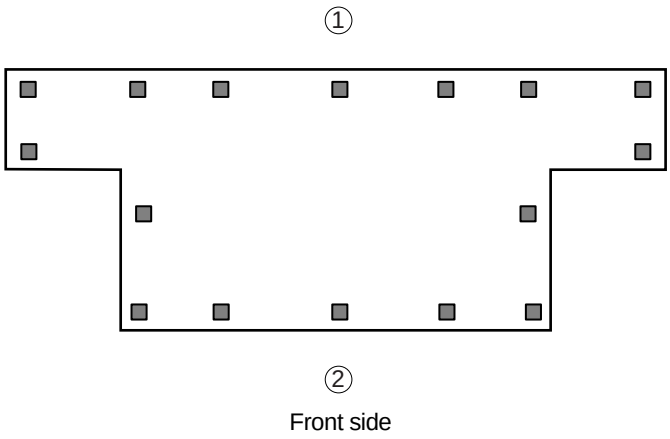
10. Supplementary Information

10.1 Noise Levels

The following table shows the measured noise levels for CP-842E during operation.

> ⚠ ***WARNING***
>
> ***Operators should wear ear plugs in operating environments where noise levels are high enough (80 dBA or more) to cause hearing damage.***

Machine Model	Max. Noise Level (dBA)	Measurement points (m)	Remarks
CP-842E	Rear side ① .....76 Front side ② 74	Height from floor: 1.2 Distance from machine sides: 1.0	Background noise 63 dB



Note: The noise level of both the CP-842ME is lower than that of the CP-842E.

MEMO:

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CP-842E/CP-842ME Mechanical Reference

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